MAY 1960

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

★ *Spotlight on Ingredients* beginning page 47
— For the first time
A list of previously unpublished FDA approvals

# FOOD PROCESSING.

Congressmen and three of the thirteen scientists at last month's panel discussion on the Delaney cancer clause are (left to right): Rep. John Bell Williams (D-Miss.), key figure in passage of the 1958 Food Additives Law; Rep. Oren Harris (D-Ark.), Chairman of the House Committee on Interstate and Foreign Commerce; Dr. Harold Blum, National Cancer Institute at Princeton University; Dr. William J. Darby, Dept. of Biochemistry, Vanderbilt School of Medicine; Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago

## Congress considers amending Food Additives Law

**The necessity for, and how to use the scientific panel...page 29**

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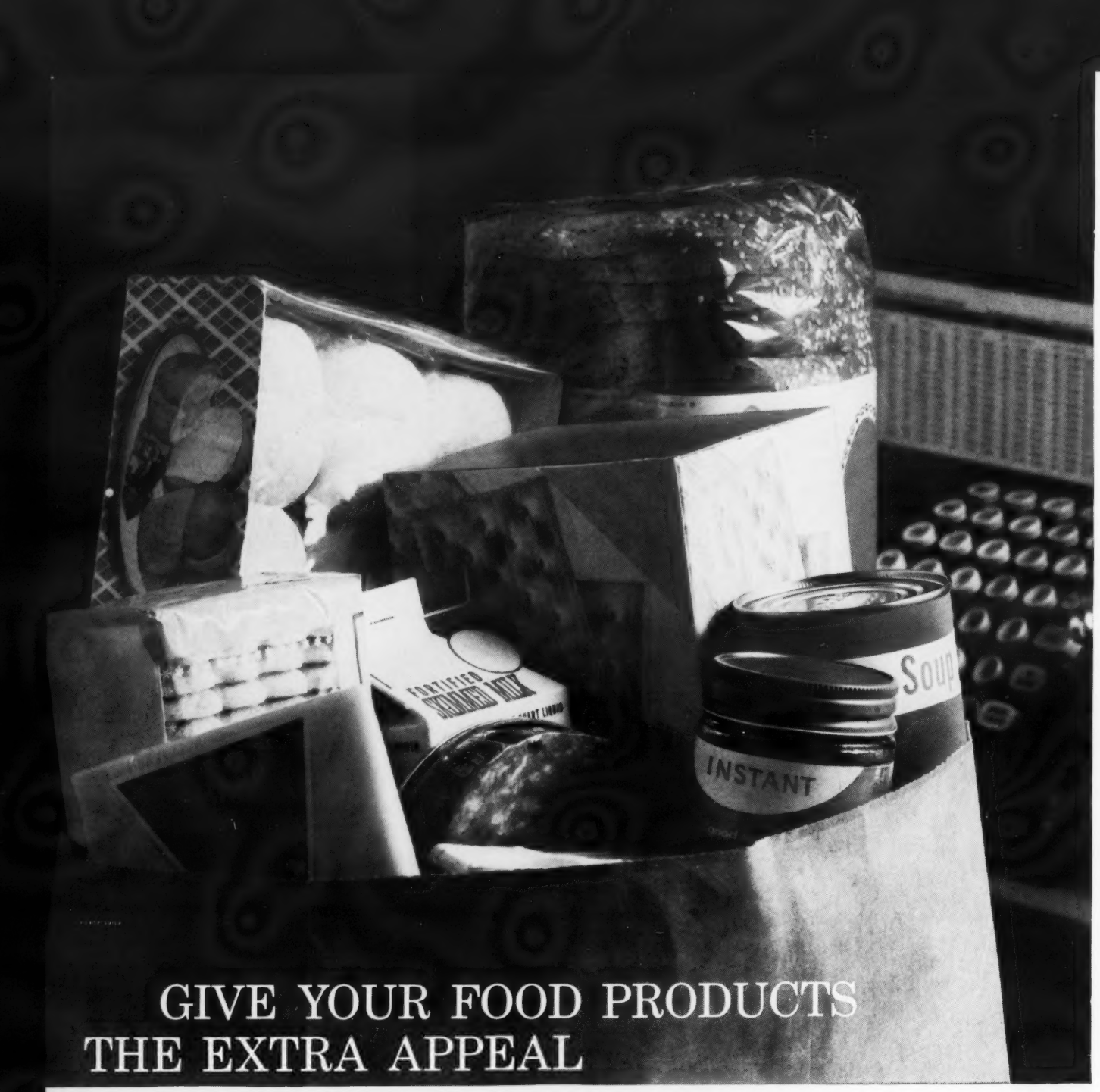


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***that's interesting***

### Once again—those genes!

The body of opinion that questions the validity of marbling in meat as an index to its tenderness has been reinforced by a taste test of meat from 450 animals which indicated that less than 10 per cent of the variability in the beef's tenderness could be explained by degree of marbling.

The test was reported by Dr. A. Z. Palmer of the Florida Agricultural Experiment Station, who believes, as some other researchers do, that beef tenderness may be inherited.

### Squeeze me a sandwich?

The Collapsible Tube Manufacturing Council believes it has a great future before it in packaging meat spreads, anchovy paste, ketchup, jelly, cheese, mayonnaise and other products. These tube foods are already commonplace in Europe.

A special interest Americans would have in tubes, the council reasons, is the food tube's convenience and economy on auto trips and on picnics.

## that's interesting

### Sequel to the cow and the moon bit

Dr. Norman Lee Barr, chief of space environment and life sciences research for Republic Aviation Corp., says an artificially simulated digestive process similar to a cow's is being used to test the practicality of converting normally indigestible food plant fibers into meat substitutes and sugars.

The point to this, he explains is that space travelers, who will face a critical food supply problem, might be able to gain nourishment from parts of space-grown plants that are not normally digestible by humans.

### Food and printed word— never should twain meet

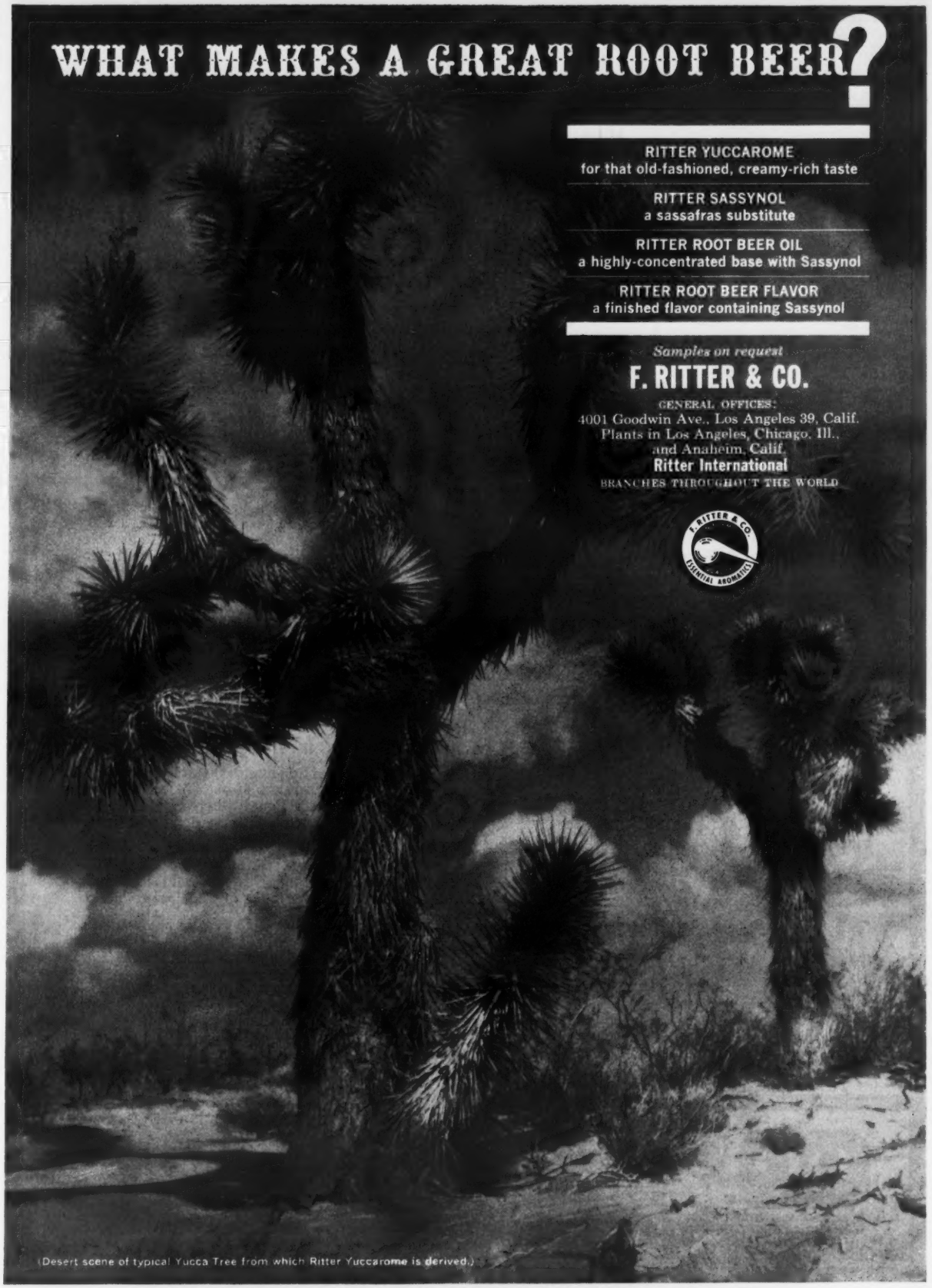
The National Printing Ink Research Institute has approved only one or two inks as entirely safe in contact with food, but it has also stated categorically that "no (ink) manufacturer can guarantee that his inks for packages comply to the letter of existing inks."

No matter how careful the ink manufacturers are, the institute concludes, "printing simply should not come into direct contact with foodstuffs."

### Soft drinks gulp record can volume

The soft drink industry's consumption of cans in 1959 used 49,102 tons of steel, 34 per cent above the 1958 record of 36,660 tons, and helped give the can industry a new record year in shipments, according to the Can Manufacturers Institute. The total 1959 can shipment figure exceeded by three per cent the previous record set in 1956. The beer industry's can use in 1959 was up 9.3 per cent.

Fruits and vegetables in 1959 used only slightly more cans than in 1958.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over the editor's shoulder

# Progress vs. the public's temper

It would now appear that no matter how distorted the views of the cancer specialists who support the HEW Secretary may be on passing judgment on food additives, they are probably most in tune with the public's temper.

Therefore, we must resign ourselves to having a cancer clause in any additive law.

The problem is developing a more rational approach to legislation on the cancer clause and to its administration.

Otherwise the continued advance of science essential for providing an adequate food supply will be stifled.

One basis for revising legislation is presented in this issue on page 27 by Dr. Norman G. White.

More specific suggestions for a rational approach to the problem follow Dr. White's article in our report of the recent scientific panel discussion on the Delaney cancer clause.

Harold P. Miller
EDITOR

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

MAY 1960
Vol. 21 NO. 5

FOOD PROCESSING

CIRCULATION OVER 39,000

## Highlights

**27 A Basis for Revising Food Additive Legislation**
A commentary on the confusion thrust on us by the Delaney cancer clause — Dr. Norman G. White, Manager, Industrial Hygiene, Shell Chemical Company

**28 Congress Considers Amending Additives Law**
The necessity for and how to use the scientific panel — Howard P. Milleville, Editor

**32 Continuous Freezing Easy with Vertical Plate Freezer**
Insulated enclosure eliminated; up to 40% more efficiency

**36 Mechanized Handling Ups Production Tenfold**
Nearly 2000 pounds of mushrooms daily from 110-acre cavern farm — Norb Leinen, Associate Editor

**48 Unpublished FDA Approvals for Intentional Additives**
A heretofore unpublished list of safe intentional additives and ingredients obtained from private correspondence

## Also Featured

19 USDA Active in Protecting Public Against Cancer
30 Food and Fallout — Part III
59 Pitfalls in Formulating Your Own Flavorings
63 Extends Shelf-Life of Marshmallows From Weeks to Months
66 Radiotracers as an Aid in Non-Intentional Additive Studies
68 Safe Additives for Meat Products, Including Shortening
77 Automatically Removes Bottle Labels from Soaking Compartment
86 Shrink-On Film for Contour Packaging of Foods
92 Smooth, Precise Fill Without Product Breakdown
100 Automatic Handling Integrates Wide-Spread Operation
108 Bulk Depalletizing Feasible With Multiple Can Sizes
113 Collapsible Container Eases Handling, Cuts Costs in Bulk Dry Shipments
117 Controls Pellet Mills for Automatic Operation
127 Determine True Volume of Any Solids Without Using Liquids
129 Two Continuous Mixers Replace Ten Vertical Mixers

### EDITORIAL SECTIONS

★ Ingredients (Editorial Spotlight) ..... 47
Sanitation & Maintenance ..... 77
Packaging ..... 86
Material Handling ..... 100
Transportation ..... 113
Instrumentation ..... 117
Quality Control ..... 127
Processing ..... 129

### DEPARTMENTS

Products & Packages ..... 8
Conventions & Exhibits ..... 10
Food Regulations ..... 11
Plants, Companies, Personalities ... 23
Association News ..... 25
New Technical Literature ..... 145
Advertisers Index ..... 151

**SPECIAL READER SERVICE**

• When you want more information, see Reader Service Slip ..... Opp. 152
• If you want to subscribe to this magazine, see reader qualification form ..... Opp. 153

# It's here! First 90% pure protein dairy product with a bland taste and odor

***Fantastic new dry milk protein has uses not yet discovered (do you have one?)***

**Sodium Caseinate** was the protein dairy product with problems. Up to now, it did not lend itself to manufactured foods because of its flavor and odor.

Interest in sodium caseinate was high because of its high concentration of milk protein.

### LAND O'LAKES GOES TO WORK

Because of this intense interest, Land O'Lakes Creameries in Minneapolis set out to produce an acceptable pure food product by eliminating its undesirable characteristics.

The Land O'Lakes team of chemists and technicians has succeeded in developing an edible sodium caseinate with a bland, clean taste and odor and creamy white color. And it's available now.

### 90% PROTEIN, 1½% FAT

At last, the dairy product the food industry has been waiting for. Sodium caseinate with many desirable characteristics. 90% protein. 1.5% fat. And it's manufactured from fresh sweet skim milk, not reprocessed casein.

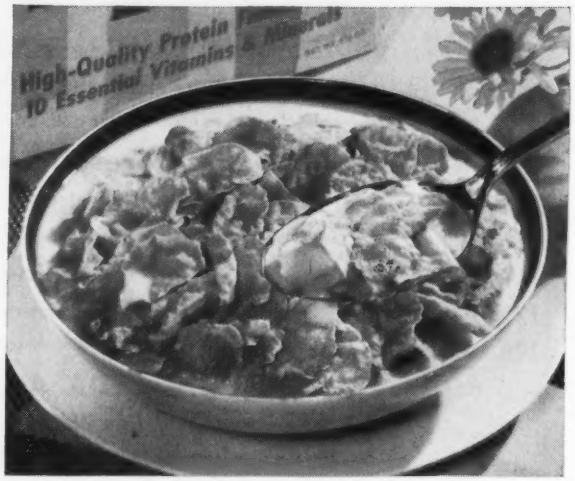
### 8 AMINO ACIDS

Land O'Lakes sodium caseinate is rich in all the essential amino acids. 50 grams of Land O'Lakes sodium caseinate supplies more than the minimum daily requirements for adults of each of the 8 essential amino acids.

Lysine is one of the most sought after, and least available, of the amino acids. But Land O'Lakes sodium caseinate has it. 50 grams has more than four times the daily minimum requirements for adults!

### 'CUTS SHRINKAGE FROM COOKING TO A MINIMUM,' SAY SAUSAGE MAKERS

Land O'Lakes sodium caseinate greatly cuts down the loss of natural fats and juices in the cooking process of sausage. Why? Because it absorbs three times its own weight in water. Because sodium caseinate in sausage is an excellent binder. It's the next best thing to "sanforizing," they say.




**Cereal makers discovered** new way to boost protein in their product by adding Land O'Lakes sodium caseinate. Added benefits developed, too. The cereals toasted better, stayed crisp longer in the bowl.

Meat processors are at work this very minute seeking new uses for sodium caseinate, the wonder milk protein, in their products. Are you keeping up with their progress?

### SYNTHETIC WHIP TOPPING DOESN'T FALL DOWN ON THE JOB, THANKS TO SODIUM CASEINATE

Wonderful response has come from synthetic whip topping manufacturers. They report sodium caseinate gives body and long life to their product. Its color is perfect. There are no odors or flavors to mask.

*Can these applications of Land O'Lakes sodium caseinate offer a clue to new ones for you? Can you use this 90% dry milk protein in your products? Let us help. We'll work with you to build a better product.*

## Land O'Lakes® *New* Sodium Caseinate

**Write, wire or phone.** The number is STerling 1-4811. We will answer your questions fast, then wire your local Land O'Lakes representative immediately.

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FOOD PROCESSING

(Food Processing Preview)

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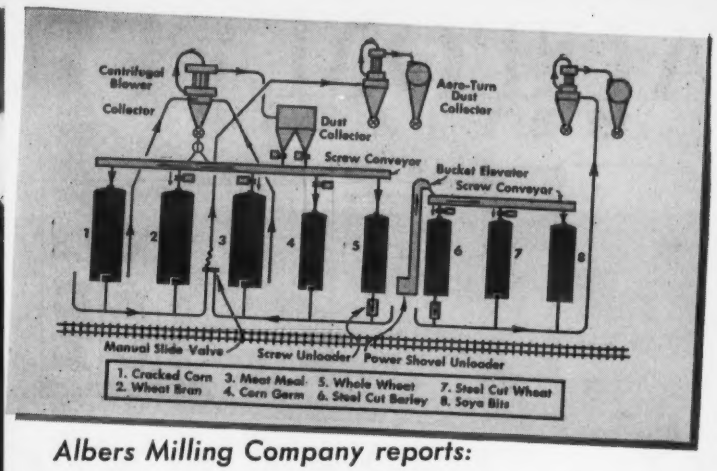
**JEFFERSON, WIS.** — Five 14′ x 40′ and three 20′ x 50′ *Permaglas* Mechanized Storage Units.




*Albers Milling Company reports:*

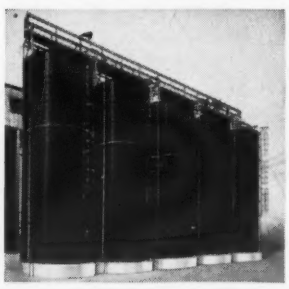
# "Permaglas® Mechanized Storage System cut our feedstuff handling cost over 50%...bulk savings average $4.00 per ton"

As illustrated in schematic diagram, the Albers Milling Company's plant, Jefferson, Wis., uses two separate unloading and transfer systems which consist of eight *Permaglas* Mechanized Bulk Storage Units (five 14′ x 40′ and three 20′ x 50′). They are equipped with A. O. Smith's exclusive mechanical sweep-arm bottom unloaders. The automatic *Permaglas* system makes possible completely sanitary storage and conveying of whole and cracked wheat, and soft ingredients for production of dry and canned dog food—called Friskies. Ten additional *Permaglas* Units with mechanical unloaders are serving at two other Albers Milling plants in Los Angeles and Kansas City.

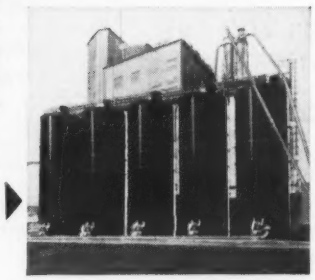
Albers' Jefferson plant reports these substantial cost-savings in time, labor and bulk purchases: **more than 50% savings in labor handling costs . . . $4.00 per ton savings from bulk purchases rather than in sacks . . . considerable gain in warehousing storage space.**

The *Permaglas* Structures are glass-fused-to-steel construction both inside and out. They provide utmost sanitary, easy-to-clean systems. The gleaming coat of glass is permanently bonded to steel at temperatures in excess of 1500° F. with bonded strength up to 20,000 psi. What's more, the rugged, mechanical sweep-arm bottom unloader discharges free-flowing materials rapidly and efficiently—eliminating packing and bridging.

Like Albers Milling, you, too, can boost profits with a *Permaglas* Mechanized Bulk Storage and Unloading system. For more details on *Permaglas* Storage Systems, mail coupon today.



**LOS ANGELES, CALIF.** Five 14′ x 40′ *Permaglas* Mechanized Bulk Storage Structures.



**KANSAS CITY, MO.** — Five 14′ x 40′ *Permaglas* Mechanized Bulk Storage Structures.

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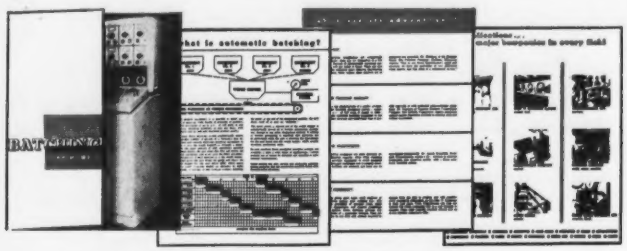
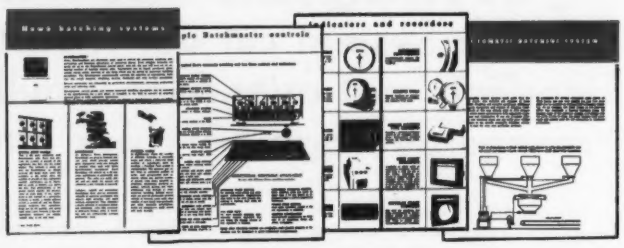


# BATCHING



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*Everything you need to know about Automatic Batching*
*How to do it*

*How much it costs*
*What you need*

*How to use what you have*
*How to select the right system*

If you are now combining two or more ingredients in any kind of formula or batch, write now for this new automatic batching handbook. It describes in detail how automatic batching works, how to convert existing plant facilities or plan new plants for automatic operation. It illustrates the latest batching systems available, helps you select the right type for your particular needs. Also shows you how to combine materials handling equipment, storage facilities, and weighing equipment for greatest economy, increased production. This is the newest, most complete handbook on automatic batching available—be sure to write for your free copy today!

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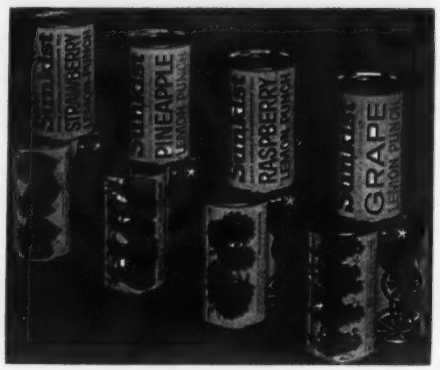
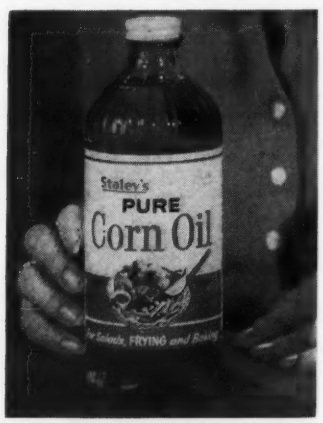



***First pure-fruit punches . . .***

. . . introduced nationally by Sunkist Growers, Inc., Los Angeles, are expected to display year-'round marketing "punch." Lemon-based frozen concentrates, offered in four flavor variations, reportedly are unique in that they use a pure fruit base, contain no synthetic flavors or colors. In market tests, the punches had no noticeable effect on sales of either fresh lemons or frozen lemonade — instead appear to create their market at the expense of other type beverages, especially canned juices.




***New corn oil for retail channels . . .***

. . . has been introduced by A. E. Staley Manufacturing Company in pint, quart and gallon sizes. Heretofore, Staley has marketed its pure corn oil solely on a commercial basis to large users.

***Easy picking***

. . . out of confusing welter of brands and products in modern supermarket's pickle department, new "consumer oriented" spot label eliminates non-essential information to focus attention on brand name and product variety. In red, white and green, and spangled with tiny reproductions of Heinz' "57" trademark, new label is being adapted to entire line of 34 Heinz pickle products.

***Ribs a la TV . . .***

. . . frozen and packed in a handy heat-and-serve 12-oz foil tray, are prepared with barbecue sauce, in addition provide two separate pouches — one with mustard and one with duk sauce. Product of Excelsior Food Products, Inc., 11-02 Bridge Plaza South, Long Island City 1, N.Y.

***Smooth-handling corrugated carton . . .***

. . . introduced by La Choy Food Products, Archbold, Ohio, for all of their American-Chinese canned foods, features several aids to easier retail-level handling. All essential information — including brand name, product name, can size and number of cans in case — is printed on all six sides. Oyster-white color makes printed information more visible for easier identification. Another "extra" is a numbered pattern for correct pallet stacking for most efficient use of standard 40 by 48 in. pallet — printed atop each case.

(Oyster-white corrugated shipping cartons are produced for La Choy by Fort Wayne Corrugated Paper Co., Hartford City, Ind.)

7136 on Reader Service Slip.

***Marshmallow breakthrough . . .***

. . . chocolate marshmallows, a blend of pure chocolate and marshmallow previously considered impossible, are being manufactured and marketed for first time in the US by Doumak, Inc., Los Angeles, Calif. Package is .0015 natural poly, flexographically printed by Milprint's "lustro" process in five colors.

***Toothsome trio for tots . . .***

. . . new line of Beech Nut Baby Foods "Protein Dinners" offer choice of chicken, lamb or beef. Color-keyed caps of red and blue, plus lettered identification on the rims, differentiate strained and junior varieties.


**ENTOLETER®**

*announces . . .*

**BIGGEST ADVANCE IN SIFTERS**

**THE Cirlyptic® SIFTER**

**A new line of the highest efficiency sifters has just been added to the Entoleter line of processing equipment . . . The unique Cirlyptic Sifter action retains product in suspension thereby providing particles more angles of approach and maximum screen put-through. No surface friction greatly reduces screen blinding.**

- Highest put-through capacity per screen area.
- No rubber balls to contaminate product.
- Flexibility of speed to achieve optimum screening action.
- All stainless steel construction.
- Meets rigid sanitary requirements.
- One minute disassembly for positive operator cleaning — Simple 3-part construction.

| 3 MODELS | | |
|---|---|---|
| Capacity per Minute* | Power Requirement | Screen Area |
| 250 lbs. | ⅓ HP | 5½ sq. ft. |
| 500 lbs. | 1 HP | 11 sq. ft. |
| 1000 lbs. | 3 HP | 22 sq. ft. |

*(Rebolting flour on 30 mesh screen).

**FOR MILK POWDER, PHARMACEUTICALS, PRE-MIX FOODS, CRYSTALS, FLOUR, CHEMICALS, ABRASIVES.**

Also *Multiscreen Cirlyptic Classifier.* Up to 4 positive cuts without screen stacking.

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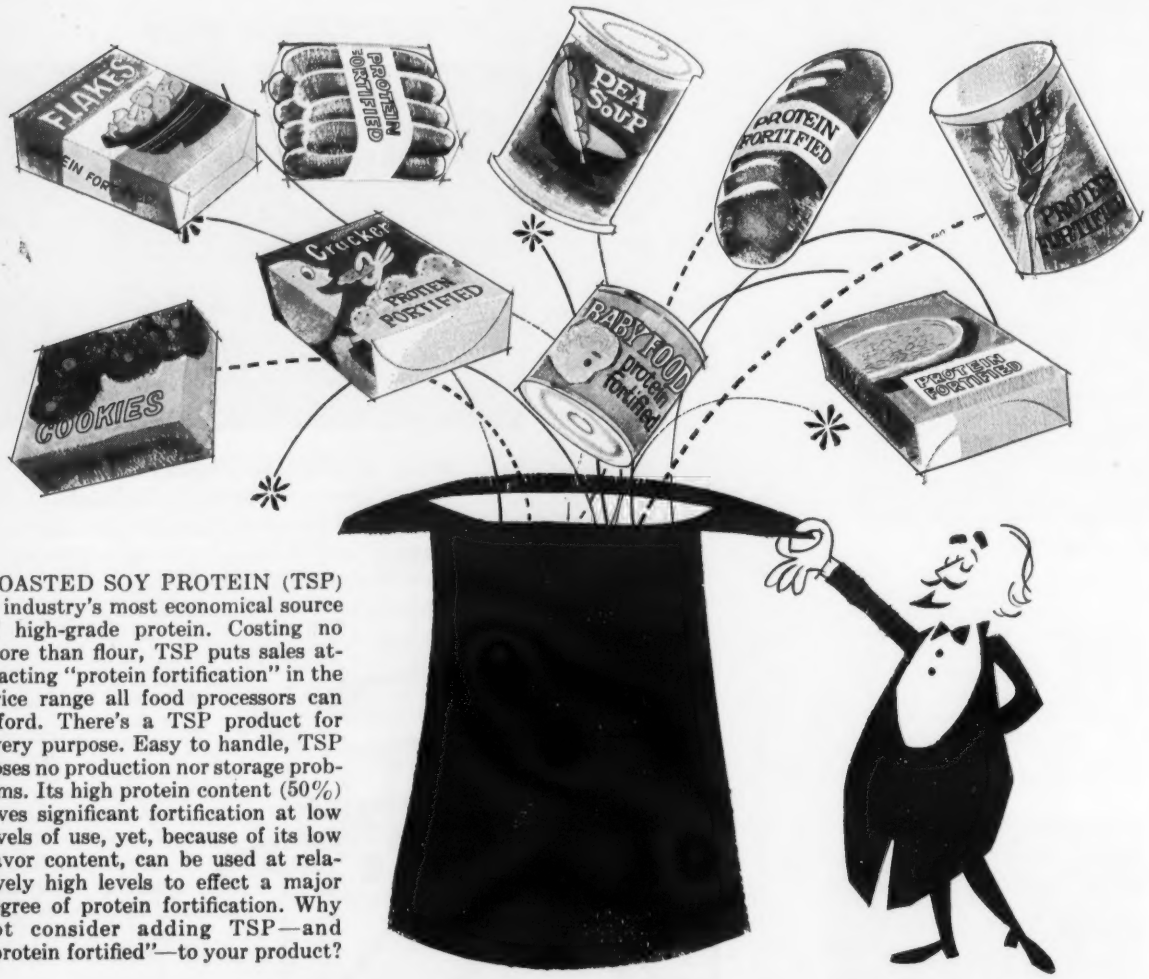
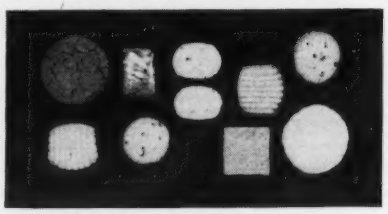
*Add General Mills* **TOASTED SOY PROTEIN** *to your product . . . and the magic words* **"protein fortified"** *to your package*




TOASTED SOY PROTEIN (TSP) is industry's most economical source of high-grade protein. Costing no more than flour, TSP puts sales attracting "protein fortification" in the price range all food processors can afford. There's a TSP product for every purpose. Easy to handle, TSP poses no production nor storage problems. Its high protein content (50%) gives significant fortification at low levels of use, yet, because of its low flavor content, can be used at relatively high levels to effect a major degree of protein fortification. Why not consider adding TSP—and "protein fortified"—to your product?

*Is there a success opportunity here for you?*

**Sausage makers use TSP to reduce binder costs.** Seeking to improve profits without loss of product quality, sausage makers are adopting TSP because of its low cost as their choice of "legally permitted binders." TSP's high protein content makes it the perfect complement to meat.



**Cookie makers use TSP in fast selling specialties.** TSP permits the cookie and cracker baker to produce delicious high protein specialties that "bite easy and chew tender." Now, through use of TSP, new character and sales appeal can be added to all types of cookie and cracker specialties.

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## conventions and exhibits

*May 15-19.* Institute of Food Technologists, 20th annual meeting, Fairmont Hotel and Masonic Temple, San Francisco, Calif.

*May 22-26.* Assn. of Operative Millers, annual technical conference, Sheraton-Jefferson Hotel, St. Louis, Mo.

*June 6-8.* Material Handling Institute's New England Show, Commonwealth Armory, Boston.

*June 6-9.* National Confectioners Assn., 1960 Confectionery Industries Exposition, Convention Hall, Philadelphia.

*June 24-25.* American Society of Enologists, Hoberg's Resort, Lake County, Calif.

*July 25-27.* American Oil Chemists' Society, 1960 short course on edible fats, Garner Hall, University of Illinois, Urbana.

*Aug. 8-12.* Gordon Research Conferences, Food and Nutrition, Colby Junior College, New London, N. H.

*Sept. 1-7.* International Union of Nutritional Sciences, Fifth International Congress on Nutrition, Sheraton-Park and Shoreham hotels, Washington, D.C.

*Sept. 11-16.* American Chemical Society, 138th national meeting, New York, N. Y.

*Oct. 17-21.* National Safety Council, 48th annual National Safety Congress, Conrad Hilton, Pick-Congress, Sheraton Towers, Morrison and La Salle hotels, Chicago.

*Oct. 24-27.* Institute of Sanitation Management, Annual Sanitation Maintenance Conference & Show, Sheraton-Cadillac Hotel, Detroit.


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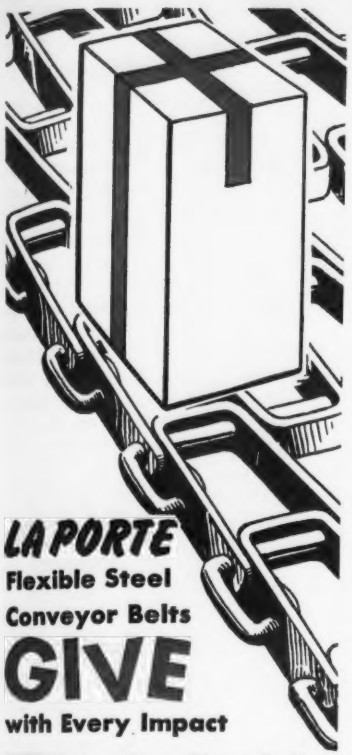

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## food regulations

# 3421 FOOD ADDITIVES

***Their status with FDA one-and-a-half months after March 6 deadline***

**1. Substances generally recognized as safe:**

**Final approval —**

182 substances of a general nature (January, 1960 FP, pg 65)

150 naturally derived seasonings and flavorings (March, 1960 FP, pg 57)

**Proposed approval —**

52 substances of a general nature (March, 1960 FP, pg 54)

67 components of paper and paperboard packages (April 1960 FP, pg 14)

FDA had previously proposed approval for 37 additives for animal feeds (February, 1960 FP, pg 40). These have now been withdrawn by FDA for further study although a new list will be issued at a later date.

**2. Substances for which prior approvals or sanctions have been granted:**

84 components of packaging materials (March, 1960 FP, pg 24)

28 paper packaging materials (April, 1960 FP, pg 16)

**3. Substances granted a time extension of one year from March 6, 1960:**

12 substances of a general nature, including 5 components of packaging materials, 6 direct additives to foods and 1 indirect additive used as a fumigant (March, 1960 FP, pg 23)

33 general additives, including 14 direct additives and 19 indirect additives (April, 1960 FP, pg 66)

135 other packaging materials (April, 1960 FP)

450 packaging materials (Federal Register, March 17, 1960, pg 2203)

31 direct additives, including 15 chewing gum and protective coating materials and 16 direct additives of a general nature (see page 56).

**4. "Petitions" to establish tolerances:**

153 "petitions" received

12 final orders published by FDA

31 "petitions" covered products which were not considered food additives because the item was generally recognized as safe, or because it has a prior sanction, or because it would not become a component of food.

47 "petitions" could not be filed because they did not have enough information in them.

4 "petitions" were otherwise disposed of (withdrawn by the company, etc.)

**5. Requests for time extensions:**

893 requests for time extensions on substances are now pending at FDA. This includes a request from the Flavoring Extract Manufacturers Association, which submitted a list covering 1152 items.

Since each request is for at least one additive, it would mean that there are requests for time extensions on at least 892 additives plus the list of 1152 additives submitted by the Flavoring Manufacturers Association. Therefore, now pending at FDA are requests for time extensions on a minimum of 2044 additives.

Substances in the "under-consideration" or pending stage are not considered illegal. Until FDA acts on a request, no legal action will be instituted.

*residue analysis...*

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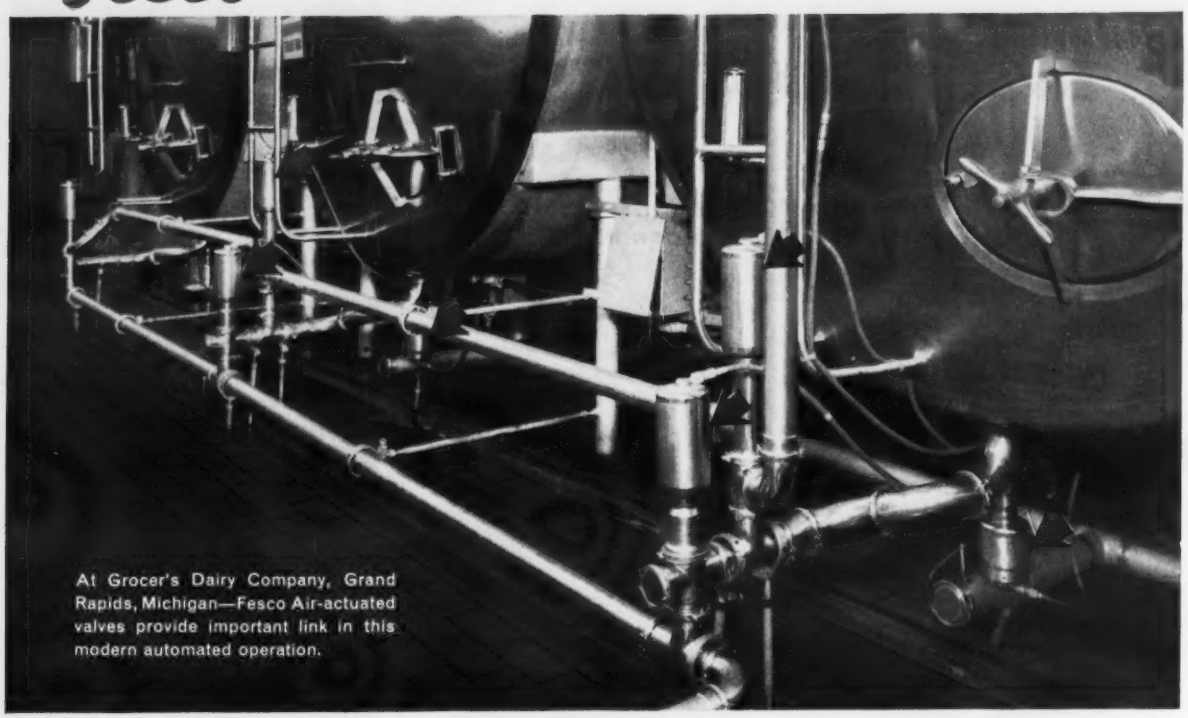
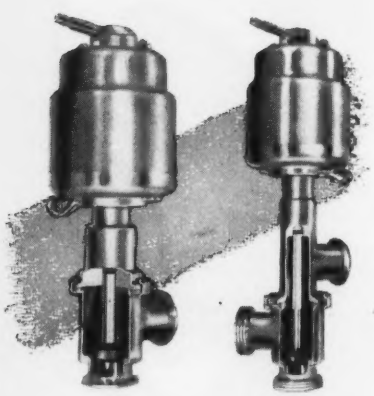
# Fesco AUTOMATIC AIR-ACTUATED VALVES



At Grocer's Dairy Company, Grand Rapids, Michigan—Fesco Air-actuated valves provide important link in this modern automated operation.

## The fast action, fast cleaning choice for automation



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With the addition of Fesco Valves, Ladish Co. continues to keep pace with the latest technological advances in the Dairy, Food, Beverage and Chemical-Process Industries.

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*food regulations*

### 1152 flavor additives in pending stage

The Flavoring Extract Manufacturers' Association has submitted an extension request covering 1152 ingredients used in flavors for foods and beverages.

The vast majority are themselves flavors, but also covered are a number of other substances called flavor adjuncts used in close association with the flavoring ingredients. Among these are emulsifiers, stabilizers, anti-oxidants, and solvents.

Along with the extension request, the FEMA is conveying to Food and Drug in installments the results of its industry-wide survey of flavor usage. The Third Section has been turned over to FDA, leaving only the Fourth and final Addenda Sections to be dealt with in the next two months.

The information thus submitted is being considered by the Food and Drug Administration.

Their first step has been to classify the ingredients covered by the extension request into several groups. No final steps, however, have been taken, and both the method of classification and the composition of the several groups are under current discussion by the FDA and FEMA.

The FDA probably will publish quite soon a list of these ingredients covered by prior sanction, and a somewhat larger list of those which are widely familiar and about which there can be no possible question as to safety. The method for handling the remaining items will be worked out within the next month.

An effort is being made to devise procedures which will provide

a) Maximum protection to the public health;
b) Maximum convenience and information to industry and the consuming public; and,
c) Maximum confidence in the foods involved and understanding of the regulations which protect them.

*that's interesting*

**Avast, weary egg scrubbers!**

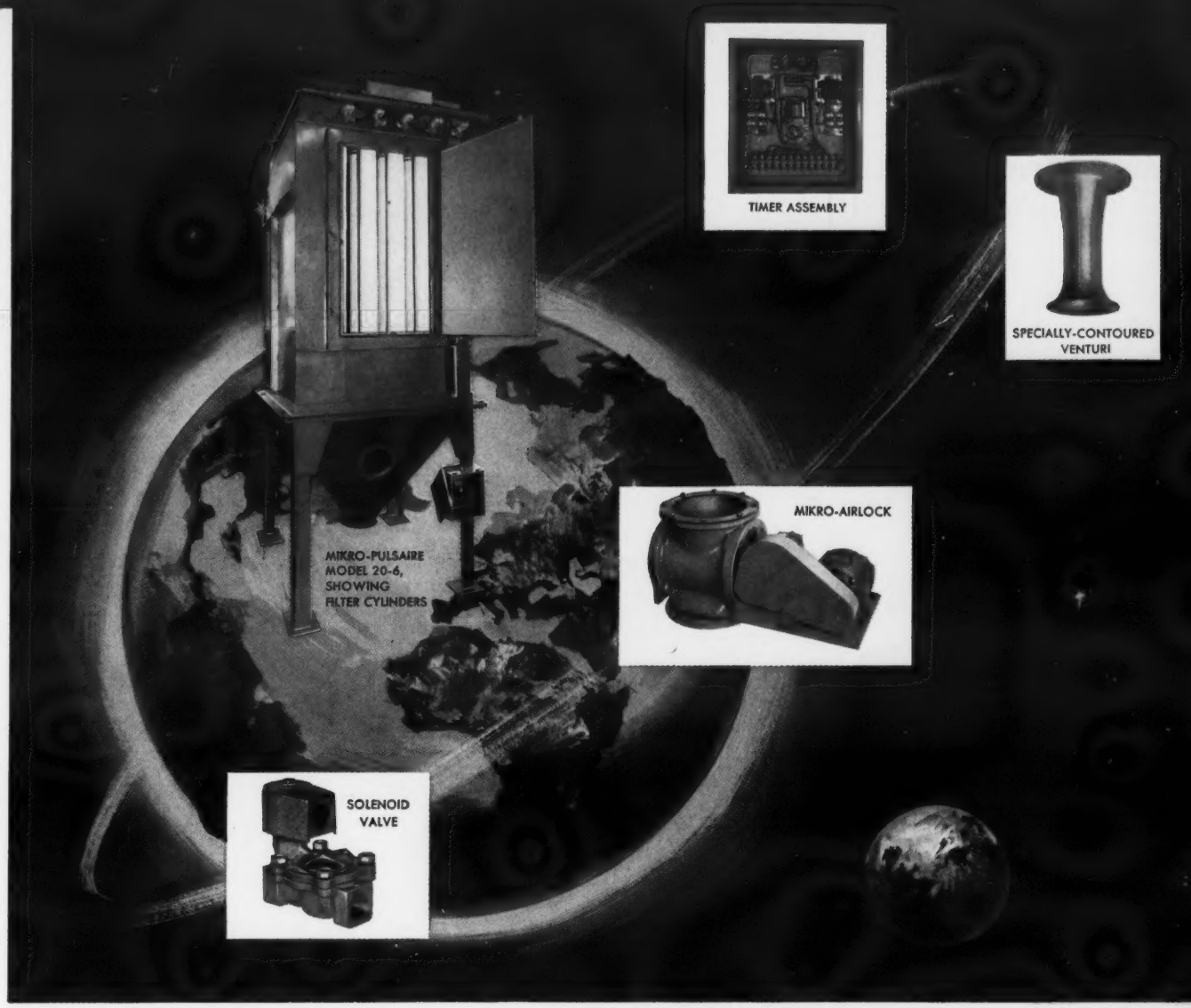
Among the many remarkable characteristics of egg shells, it seems, is their capacity to quickly wear out the brushes that clean them. And in a time when eggs must be cleaned on a

large scale for the premium "Grade AA" egg market, this attrition poses a costly brush replacement problem to poultrymen.

Du Pont, however, has produced a brush bristle made with Tynex nylon that reportedly can wash egg shells, and withstand the harsh chemicals involved in this job, for years on end without replacement.

American Veterinary Supply Co., Anaheim, Calif., produces the cleaning units.

For more information on product at right, circle 7142 see information request blank opposite last page.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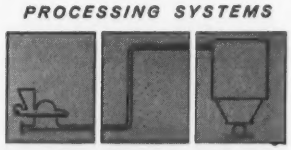


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**"Unpublished Approvals"**

The ingredients which FDA has given approval to through private correspondence with various suppliers will be found starting on page 48.

## FDA sets tolerances for miticide on deciduous fruits

FDA has established tolerances for a miticide, and USDA has approved its use on some 11 deciduous fruits. Known under the registered trade mark of Tedion, the miticide is manufactured by the Niagara Chemical Division of Food Machinery and Chemical Corporation, Middleport, New York.

A tolerance of 5 ppm of the miticide has been established for apples, crab apples, pears, quinces, plums, prunes, grapes, apricots, cherries, peaches and nectarines.

Under the tolerances set by FDA, it is possible to make three applications of Tedion to the pome fruits if this is preferred. Tolerances were previously established for use of miticide on citrus.

With the new approval, the miticide can be employed to control essentially the complete mite complex. Previously applications could be made only up until petal fall. For the most part, this limited control to the early-appearing European red mite.

Now treatments can be made when fruit is present on the trees in order to control summer mites, including the two-spotted spider mite, McDaniel mite, canadensis mite and carpini mite.

**Exempt from FDA approval** are many additives cleared by USDA for use in Federally inspected meat plants. See complete list on page 68.

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**Bring Out Flavor** normally masked by high protein levels in other dairy ingredients. The milk sugars in Krafen allow flavor to come through stronger. This means that frozen food manufacturers, for example, save substantially on the use of expensive seasonings.

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**Save up to 5¢ a Pound** on dairy solid costs by using Krafen—and still be assured that you're using a superior replacement for your present ingredient. For Krafen is a high-quality, low-bacteria dairy ingredient produced by Kraft under conditions of maximum sanitation in one of the world's largest whey plants. Why not experiment with Krafen in your *new* products as well as *present* products. Send for your free test sample today.

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**FDA gives time extension** to 31 more direct additives. See page 56.

## FDA STANDARDS

**Ice Cream:** These long-awaited standards are still bogged down at FDA. They have moved along to where it is hoped that an order can be released shortly.

**Orange Juice:** Described in last month's column, these standards will have to be resolved at a public hearing to be announced soon. Numerous comments were received and the order on the controversial standards has been stayed.

**Canned Fruits — Canned Prunes, Seedless Grapes, Berries and Plums:** Lengthy definitions and standards of identity have been proposed by the National Canners Association and published by FDA.

At the same time, FDA published a notice to canners and distributors of canned prunes, canned seedless grapes, canned berries, and canned plums that pending the effective date of standards of identity for these products it will not recommend legal action for failure to list ingredients on labels.

**Canned Pineapple:** Mint flavoring for canned pineapple would be permitted under a proposed change in this standard.

FDA also invited written comments as to whether the standard should provide for the addition of spice, vinegar, and flavoring other than artificial. Such optional flavoring ingredients are already permitted under the identity standards for most other canned fruits.

Under both proposals, the label of canned pineapple would be required to state the use of any optional flavoring ingredient.

**Vanilla extracts:** Two industry proposals for identity standards are under consideration by the FDA. One was submitted by McCormick

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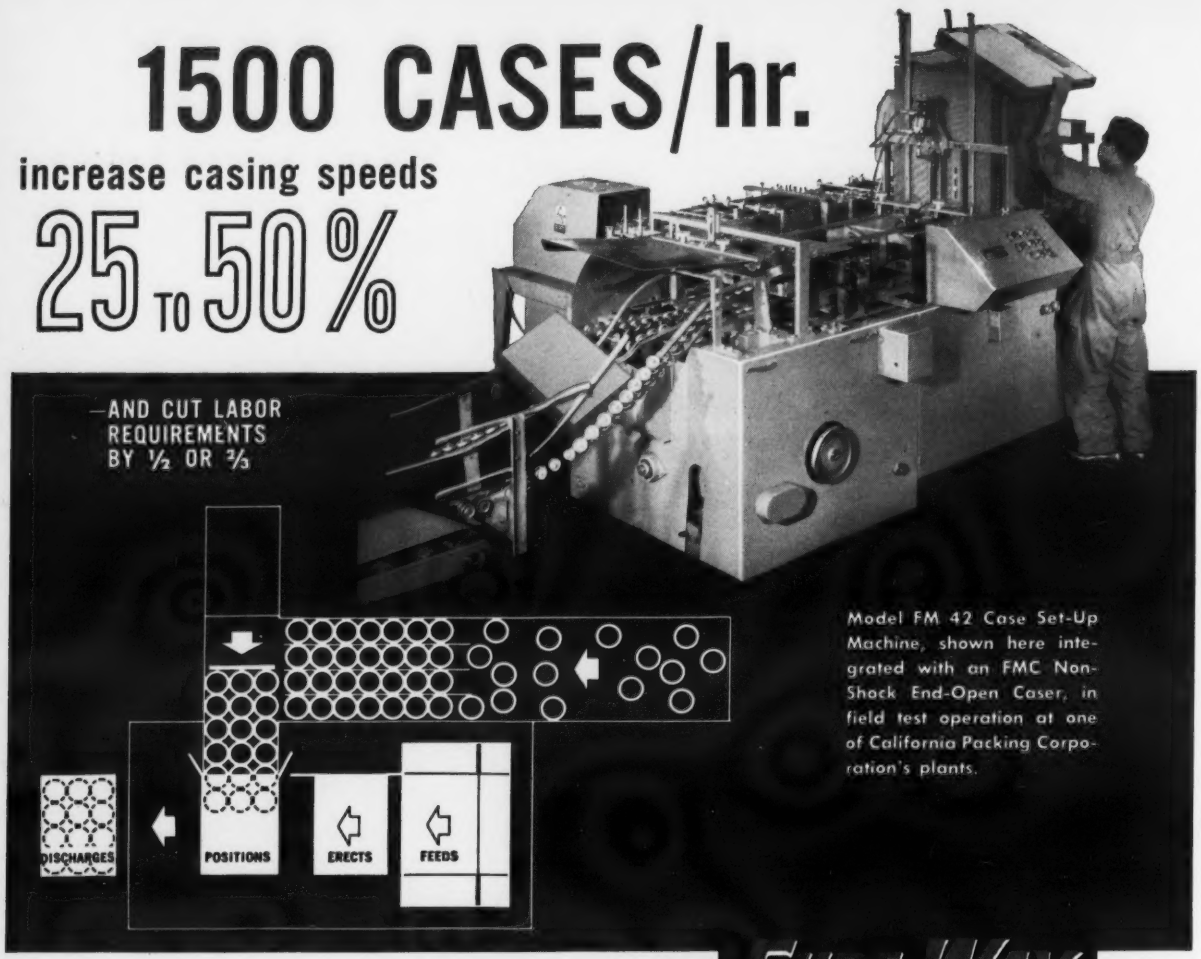


Model FM 42 Case Set-Up Machine, shown here integrated with an FMC Non-Shock End-Open Caser, in field test operation at one of California Packing Corporation's plants.

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& Co. last February; the other by a group of five flavor manufacturers: American Food Laboratories, Inc., David Michael & Co., Inc., Food Materials Corp., Fred Fear & Co., Vanilla Laboratories, Inc. Virginia Dare Extract Co., Inc. and S. H. Mahoney Extract Co.

Major difference in the proposals appears to be in the minimum weight of vanilla beans from which a gallon of extract is made.

**Cheeses — Cheddar, Washed Curd, Colby, Granular, Swiss:** A semi-final order has been published to provide for the optional use of hydrogen peroxide and catalase in treating the milk used in making such cheeses.

The weight of the hydrogen peroxide must not exceed 0.05 per cent of the weight of the milk treated. The weight of the catalase preparation to eliminate the hydrogen peroxide must not exceed 20 parts per million of the weight of the milk treated.

Unless any provision is stayed by objections the amendment becomes final next month.

**Fruit Preserves and Jams:** An amendment has been denied which would permit the addition of cherry liqueur and rum as optional ingredients.

If objections are made to the denial, a public hearing will be held.

**Orange Juice and Orange Juice Products:** Objections have been filed to an order promulgating standards of identity for orange juice and orange juice products (April FP, pg 17). Therefore, order has been stayed and public hearings to resolve the issues will be held at a later date.

**FDA approval** of safe lining materials for processing equipment. See page 48.

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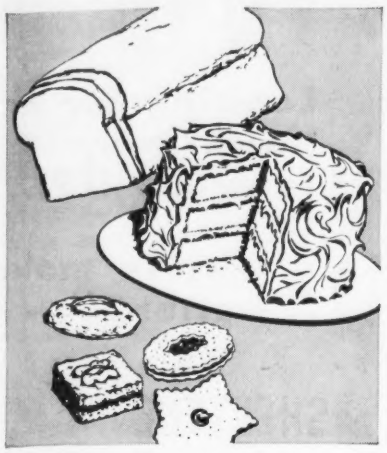
*New Improved*
**SOY FLOUR**



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# USDA active in protecting public against cancer

Dr. Floyd DeEds prepared statement for the Scientific Panel Discussion on the Delaney cancer clause (see page 29) is so interesting that we reprint it here in its entirety

**Dr. Floyd DeEds**
Chief of Pharmacology Laboratory, USDA

THE Pharmacology Laboratory was established in 1931 as part of the Food Research Division of the former Bureau of Chemistry and Soils. This laboratory was housed in the Department of Pharmacology, Stanford University School of Medicine, San Francisco, Calif., until it was moved to the Department's Western Regional Research Laboratory, Albany, Calif., in 1944.

The primary objective in establishment of this laboratory was the procurement of acute and chronic toxicity data on chemical compounds important to the Department's interest in foods.

To a large extent the investigations of the Pharmacology Laboratory concerned new organic pesticides designed to replace the inorganic lead, arsenic, and fluorine compounds in common use prior to 1931. The Department was fully aware that the old inorganic compounds which had been used for so long poisoned the soil, that lead and arsenic residues could produce anemia upon repeated ingestion, that arsenic is a carcinogen, and that fluorides, in excess of the amounts now recommended for fluoridation of the public water supplies, produced bleaching and mottling of teeth.

It was recognized by Departmental investigators that a successful organic pesticide should volatilize or decompose to a harmless substance after exerting its pesticidal action, and thus fail to poison the soil or leave a toxic residue on food. If a residue remained, it was recognized that the amount had to be small enough to present no toxicity hazard to the consumer.

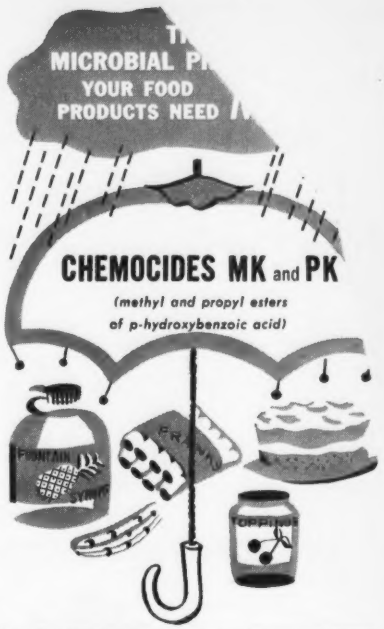
In concluding these introductory remarks it should be noted that the Department was alert to its responsibility in preventing health hazards traceable to chemicals gaining entrance to foods prior to the 1938 amendment of the Food and Drug Act and prior to the excellent control and research facilities existing in the Federal Food and Drug Administration today for the same purpose.

Because of its bearing on the controversy over the Delaney Clause, it is appropriate to discuss briefly the Pharmacology Laboratory's investigation of 2-acetylaminoflourene, a compound which had some promise as a pesticide. Investigation of this compound was started in 1938, and it was soon discovered that it was an unusually potent and unique carcinogen.*

Single doses of 2-acetylaminofluorene as large as one gram per kilogram of body weight given orally to rats failed to produce evidence of acute toxicity. These rats died in 239 to 667 days from natural causes, such as pneumonia with no evidence of cancer.

However, the daily ingestion of dietary levels as low as 40 parts per million (PPM)

*Volume V. of "Advances in Cancer Research" for the year 1958 (Academic Press, 111 Fifth Avenue, N.Y.) devotes 100 of the 463 pages of this volume to a summary of the flood of research of 2-fluorenamine (2-acetylaminoflourene) stemming from the important discovery of the Pharmacology Laboratory. The authors of the pertinent section of this volume are E. K. Weisburger and J. H. Weisburger of the National Institutes of Health.




- Accepted as safe— under Food Additives Amendment
- Effective in acid, neutral and alkaline pH ranges
- More active against molds, yeast and bacteria
- In addition to inhibitory action—can be bactericidal and fungicidal
- Soluble in aqueous and organic media
- Calcium or sodium salts available experimentally for increased water solubility
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Chemocides MK and PK, and their sodium and calcium salts, are immediately available. For additional data and samples write our Technical Service Department.

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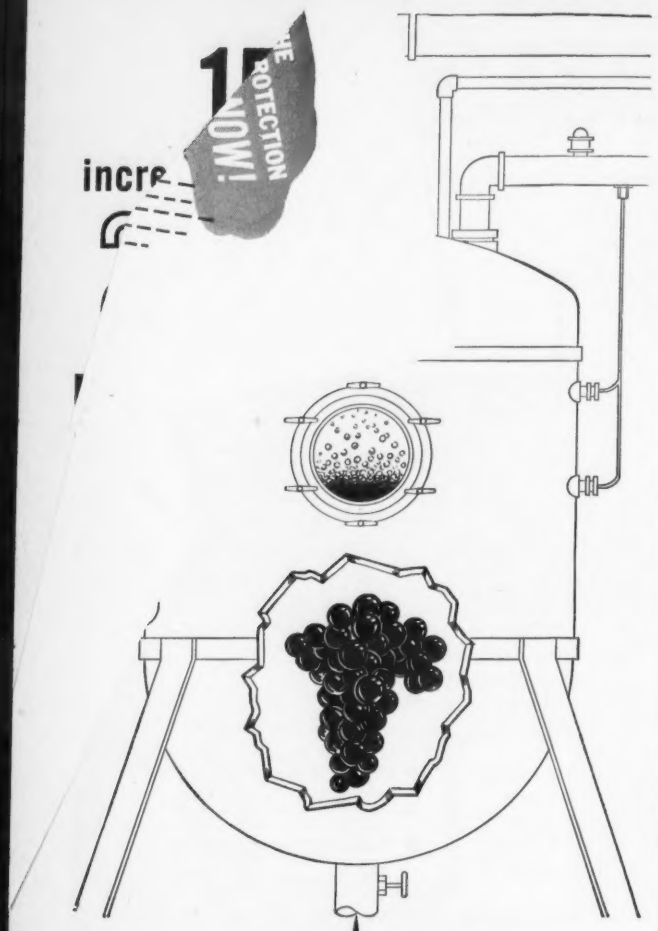


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produced cancer as early as 408 days, whereas a dietary level of 10 ppm produced no cancer in 741 days. **Here then is evidence of a no-effect level of a potent carcinogen in rats. (A no-effect level of a potent carcinogen is more significant than it would be for a weak carcinogen.)**

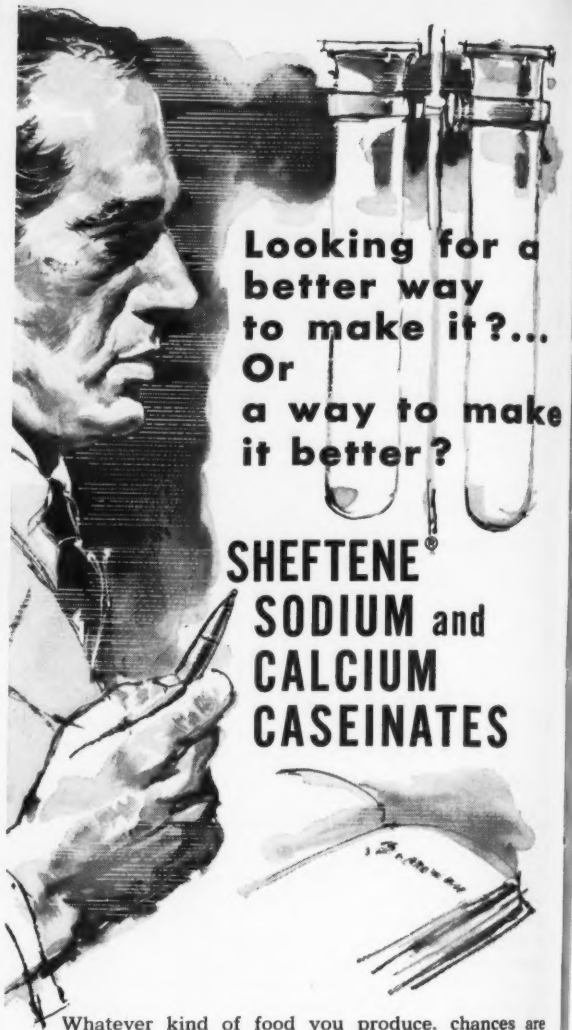
The unique character of 2-acetylaminofluorene is emphasized by the fact that it causes a greater variety of cancer in a greater variety of organs than any known carcinogen; that the most effective route of administration is oral, and that the neoplasms usually occur remote from the site of application.

The observation that 40 ppm of 2-acetylaminofluorene produced cancer in rats whereas 10 ppm did not merit brief discussion. In the first place, the observation contradicts the statement made in defense of the Delaney Clause to the effect that no one can tell how small an amount of a carcinogen will fail to produce cancer.

Secondly, although a no-effect level for this carcinogen was found, all thought of its use as a pesticide was given up for the simple reason that carcinogenic activity at a dietary level of 40 ppm does not permit a margin of safety for this particular compound. The use of this compound as a pesticide was prevented by the exercise of sound judgment based on scientific data.

On the other hand, if investigation of a compound shows that the minimal dietary level capable of producing cancer far exceeds the amount that could conceivably exist in or on food under the proper conditions of usage of the compound, it seems logical to permit sound scientific judgment to play a role in any decision to be made.

The need for latitude in exercising scientific judgment in the interpretations or decisions to be made following procurement of toxicity data is well illustrated by the interesting situation presented by selenium. Here we have a substance which in the minute amounts found in casein is not only beneficial, but appears to be an essential nutrient. In larger amounts it is toxic in a variety of ways and has even

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**Bakery:** As a high-protein ingredient for bread.

As a volume controllant to insure proper texture and uniformity of doughnuts, cookies and waffles.

As a fat-blocking ingredient to prevent excessive absorption of fat in frying of doughnuts.

**Dairy:** As a stabilizer and emulsifier in milk shake bases.

As a low-calorie stabilizer in ice cream for diabetics.

As an agent to assure the keeping quality of ice cream.

**Cereals:** As a supplement to improve the "amino profile" of grain cereal products.

**Infant Foods:** As a high-quality, high-protein supplement in infant and special dietetic products.

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been reported to be carcinogenic.

Depending somewhat upon the species involved, amounts of selenium in the range of 0.05 to 0.3 ppm promote growth, prevent white muscle disease, and in the case of exudative diathesis in chicks restore the red blood cell count and hemoglobin values to normal.

Higher levels of selenium, approximately 100 times the beneficial levels, do produce toxic effects such as low conception rates, malformations of the embryos, and still births. Eleven of 53 rats developed adenoma or low grade carcinoma of the liver after surviving 18 to 24 months on diets containing 5, 7, or 10 ppm of selenium.

Consequently, the present interpretation of the Delaney Clause prevents addition of the required amounts of selenium to livestock and poultry feeds in areas of selenium deficient soil. Another way of stating the difficulty is that permission could not be granted for adding to deficient feed the small amount of selenium equivalent to that found in the casein of normal dairy products consumed by the human population.

The desirability of making decisions relative to chemical additives on the basis of scientific data rather than on broad generalizations is all the more important when a compound is not carcinogenic per se but acts secondarily when unreasonably high dietary levels produce metabolic end products in excess of the body's ability to handle the situation.

For example, certain glycols are metabolized to oxalic acid in the animal body, and when high dietary levels of one percent or more are fed to rats the irritant action of oxalate stones in the bladder produces tumors. These are interesting facts, but it is far from obvious that this situation existing at high dietary levels of these glycols should put a ban on the presence of minute amounts in food.

A ruling which arbitrarily classifies these glycols as carcinogens becomes all the more difficult to live with when it is realized that the glycerol present in all fats and oils and


# Refrigerate

## MEAT, DAIRY, FRESH AND FROZEN FOOD PRODUCTS

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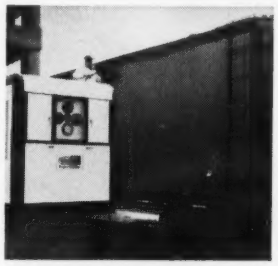

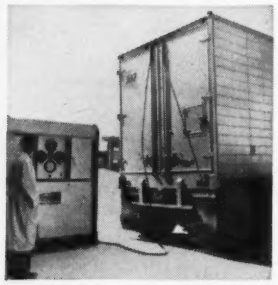

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The Pureco $CO_2$ *Blast Chilling* process accomplishes in minutes what mechanical units take hours to do. Pureco carbon dioxide liquid sprayed into the truck or railroad car reduces interior temperatures to sub-zero almost instantly. Six to seven hour pre-cooling periods are cut to minutes . . . after loading pull-down periods of two to four hours are eliminated. Product temperatures remain constant.

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*Blast Chilling* flushes out the warm moisture-laden air and replaces it with cold dry vapor, thus mechanical units do not "ice up"—operate far more efficiently.

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**No Special Equipment is Needed.**

Pureco $CO_2$ *Blast Chilling* needs no special equipment. It acts as an auxiliary to your truck or car's normal refrigeration system . . . mechanical units, hold-over systems or "DRY-ICE".

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Pureco would like to demonstrate *Blast Chilling* to you in *your plant* under *your working conditions* . . . with no obligation on your part. Call your local Pureco representative for details or write:

New Pureco booklet "How Carbon Dioxide Serves You". Write for free copy.

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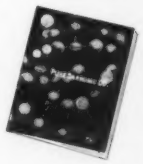

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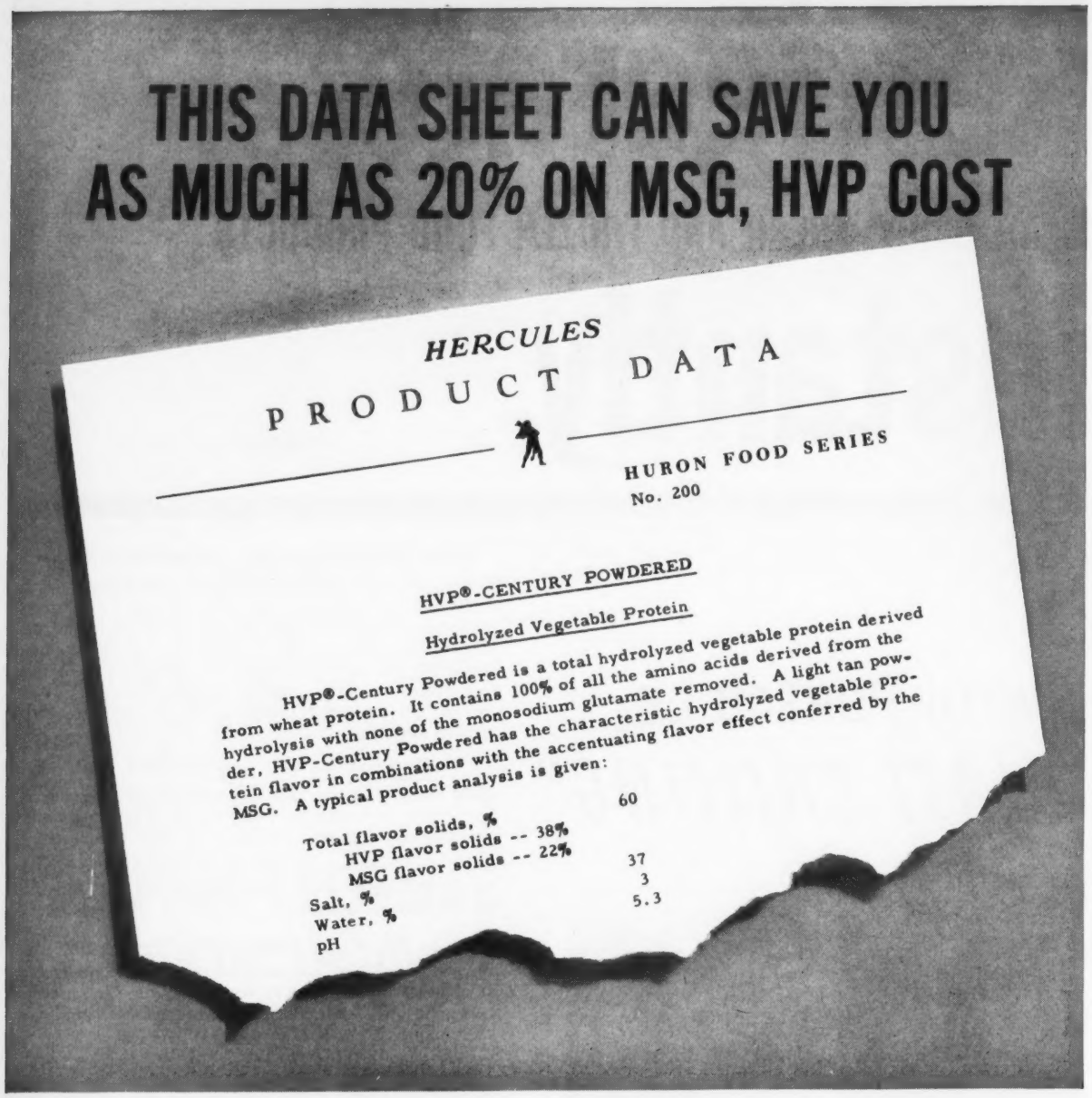
HERCULES
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No. 200
HVP®-CENTURY POWDERED
Hydrolyzed Vegetable Protein
HVP®-Century Powdered is a total hydrolyzed vegetable protein derived from wheat protein. It contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed. A light tan powder, HVP-Century Powdered has the characteristic hydrolyzed vegetable protein flavor in combinations with the accentuating flavor effect conferred by the MSG. A typical product analysis is given:
Total flavor solids, % 60
HVP flavor solids -- 38%
MSG flavor solids -- 22%
Salt, % 37
Water, % 3
pH 5.3

Now—besides its full line of HVP powder and liquids as well as MSG—Hercules offers HVP®-Century powdered, a total hydrolyzed vegetable protein derived from wheat protein. Containing 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed, this new product offers the possibility of cost savings and processing advantages wherever the flavor of well-browned beef is desired.

This new four-page data sheet provides complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. We'll be glad to send you a copy along with a sample of HVP-Century. For information, write to

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**HERCULES POWDER COMPANY**
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*900 Market Street, Wilmington 99, Delaware*

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amino acid glycine, an important constituent of gelatine are metabolized in the animal body to form oxalate.

Should fats and gelatine be considered carcinogenic?

This brief discussion could be expanded to cite numerous instances of scientific fact which make it difficult to live with an arbitrary ruling. We are all against toxic chemicals in foods in general and are especially concerned with those that are carcinogenic.

However, a plea should be entered for the right to conduct adequate and properly designed toxicological tests followed by critical unbiased interpretation of the data, with due regard to practical conditions of usage of each compound under investigation.

In an effort to avoid a prejudicial point of view regarding the Delaney Clause, I have sought the opinion of members of the Stanford Medical School faculty; members whom I feel are qualified to offer an opinion and whose judgment I respect. A composite of these opinions is as follows.

The toxicological data relative to pesticides, food additives, etc. should be carefully evaluated by properly qualified experts. Because of the special importance attached to the subject of cancer, it might be advisable to have a specific requirement in the Food and Drug Act Amendment to the effect that toxicological data suggesting carcinogenic properties of a compound must be evaluated by experts in the field of cancer.

The administrative decisions made should be based upon the best scientific judgment rather than being determined by legislation.


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**FOOD PROCESSING** has an opening on its editorial staff for a food technologist with processing experience or a chemical engineer familiar with food processing.

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Seltzer

In major research reassignments at **Thomas J. Lipton,** the former director of technical research, Dr. Arthur J. Harriman, has been named to the post of director of product exploration and research liaison (with other Unilever research groups); **Dr. Roy E. Morse,** most recently an assistant research director and formerly chairman of Rutgers University's Food Science Department, has succeeded as technical research director; **Edward Seltzer,** for several years chief engineer at Lipton, has been appointed assistant director of research.

Suerth

Wakefield

Frens

**Gerber Products Co.** has elected three new vice presidents. **John C. Suerth,** formerly general manager for manufacturing, is now vice president for manufacturing; **Ray B. Wakefield,** formerly research and quality control director, is now research vice president, and **Arthur J. Frens** continues as assistant to the president with title of vice president.

**Frederic J. Janssen,** a 23-year veteran of **American Molasses Co.** and specialist in candy analysis and new formula development, has been appointed chief candy technologist in the company's Technical Services Department.


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*NEW DODGE CAB-FORWARD* Dodge Cab-Forwards handle with ease, even where back-in space is tight. There are many reasons: compact 89¾-inch bumper-to-cab-back dimension; short wheelbases; tight turning diameters; wide front tread; easy steering . . . manual or power.

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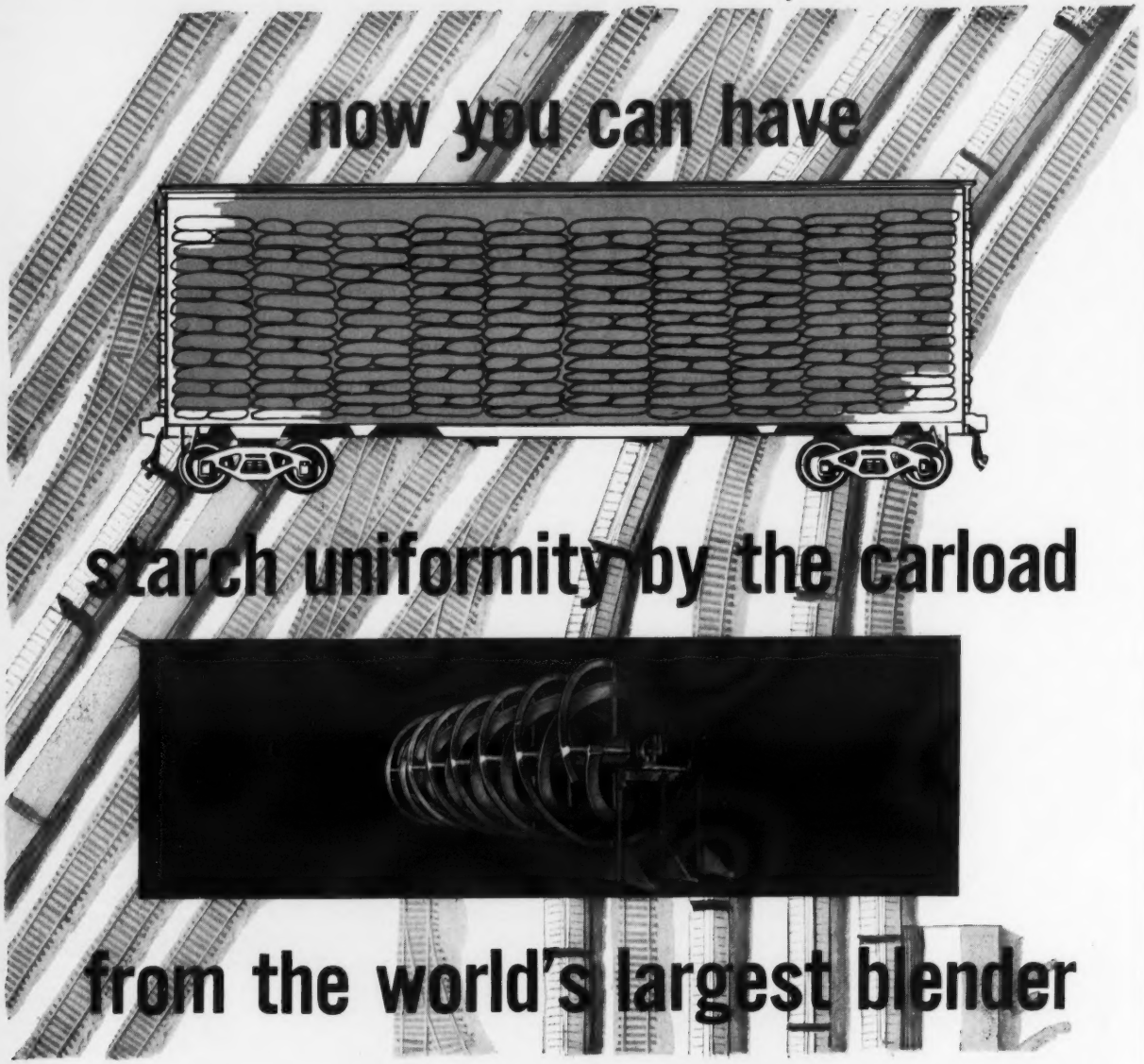


## New Penick & Ford Blender ensures production quantities at pilot plant tolerances

The big advantage of having your corn starches mixed in the world's largest blender is not size of batch, but the perfect starch uniformity you get . . . up to 60,000 lb. with one bag exactly the same as the next. The blender is part of Penick & Ford's new starch derivative plant which is designed to deliver corn products of improved quality and precise uniformity. With its new facility, P & F can offer industrial starch users production quantities to exact customer specifications, no matter how large or small the order. Call

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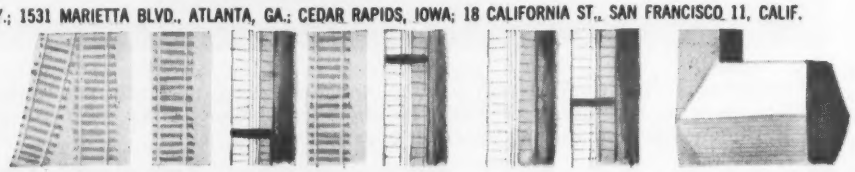

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**plants companies personalities**

**Timothy Mojonnier,** 83, founder and board chairman of **Mojonnier Bros.,** Chicago manufacturer of food and dairy processing equipment, died March 16 in West Suburban Hospital, Oak Park, Ill. He was author and co-author of several text and reference books on dairy technology, the best known being "The Technical Control of Dairy Products."

**T. M. Glen,** head of engineering for **Seabrook Farms Co.,** Seabrook, N.J., has been promoted to manager of manufacturing. He continues to head the plant engineering sections as well as the manufacturing, planning and control sections of the company.

Glen

Martin

**M. J. Martin,** who has been with **Penick & Ford,** producer of corn, sugar cane and maple products since 1915, has been elected president, succeeding Dr. J. M. Widmer, who retired.

The **University of California** has honored **Dr. William V. Cruess,** a food scientist who has retired after 40 years with the university, by naming its food technology building at Davis, Cal., Cruess Hall in his honor.

**Cornell University's New York State Agricultural Experiment Station** at Geneva, N.Y., dedicated a new $4 million food research building and pilot plant May 5. The new facilities are for advancement of the agriculture of New York State.

association news

## Over 200 Papers, 100 exhibits at 20th Annual IFT

At its 20th Annual Meeting — about to get underway in San Francisco — the Institute of Food Technologists will consider the subject of food from every aspect, from basic research to packaging.

Open to non-members for a $15 registration fee, meeting sessions will feature a record 200 technical papers, while more than 100 exhibitors will present the latest in laboratory and processing equipment, ingredients and food product developments.

Specific technical session subjects to be discussed include food additives, microbiology and the public health, convenience food packaging, quality control and instrumentation, radiation preservation, flavor research and flavor chemistry.

Separate technical sessions will be devoted to meat, fish, poultry, fruits products and vegetable products.

A special feature of the meeting will be presentation of the 1960 Nicholas Appert Award for outstanding achievement in the food technology field to Prof. Ernest H. Wiegand, former head of the Department of Food Technology at Oregon State. Although retired from this post since 1952, Dr. Wiegand continues as a department consultant.

His contributions to the food industry include development of the recirculation type of tunnel food dehydrator, perfection of methods of canning and freezing of foods, improvement of brining and finishing processes for cherries and invention of fruit grading machines, in which he holds two public service patents.

In addition, Dr. Wiegand pioneered the "short course" method of disseminating technical information, and has been an outstanding educator in the field of food technology.

The Appert Award consists of a $1000 honorarium and a bronze plaque. END


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Cocoanut, Imitation
Currant, Imitation
Grape, Imitation
Grape (Concord), Imitation
Grapefruit
Lemon (Natural)
Lemon, Imitation
Lemon-Lime (Natural)
Lemon-Lime, Imitation
Lime (Natural)
Lime, Imitation
Loganberry, Imitation
Maple, Imitation
Mint (Natural)
Orange (Natural)
Orange, Imitation
Peach, Imitation
Peppermint (Natural)
Pineapple, Imitation
Punch, Imitation
Raspberry, Imitation
Root Beer
Rum, Imitation
Rum and Brandy, Imitation
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Strawberry, Imitation
Tutti Frutti, Imitation
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Other Entrapped Flavors developed on request

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Available for the first time to the Beverage Industry, a Dry Cloud. Does not contain any brominated oils. Two pounds when dissolved in water to one gallon will produce one gallon of Standard Cloud Solution of which one ounce per gallon of Syrup will produce an excellent suspension in the finished product. ¼ oz. will sufficiently cloud 1 gallon of finished beverage.

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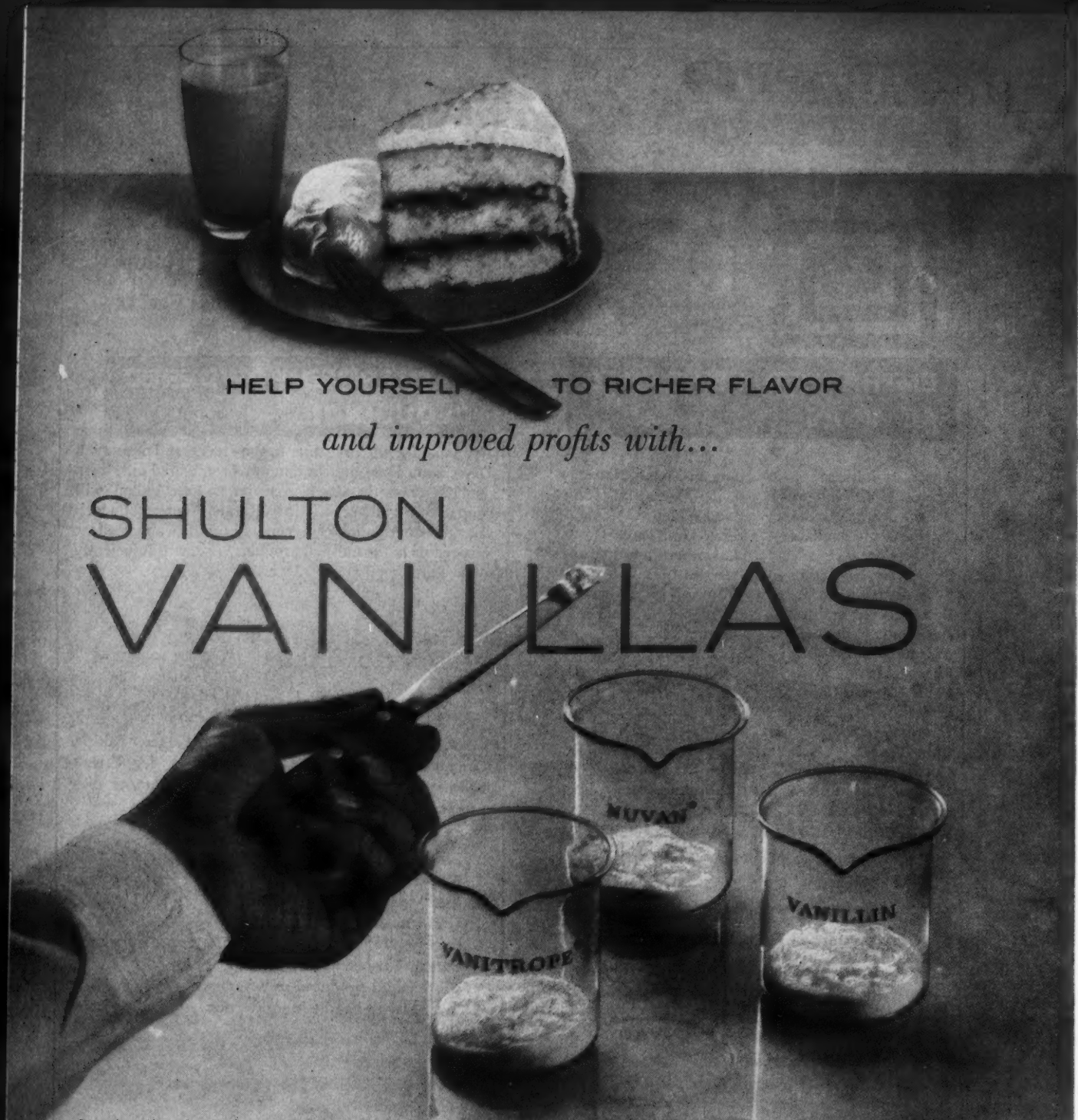


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THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE
FOOD PROCESSING
MAY 1960
VOL. 21 NO. 5

### A timely and provocative reappraisal suggesting . . .

# A basis for revising food additive legislation

**We should have absolute confidence that the *majority opinion* of expert toxicologists will be in the best public health interests; we should therefore proceed to give the majority opinion official status.**

**Until the dispute over the Delaney Cancer Clause is settled we must maintain at all costs public confidence in both our food supply and in the integrity of its public servants.**

**NORMAN G. WHITE, PhD**
Manager, Industrial Hygiene
Shell Chemical Company

Dr. White has been intimately involved in establishing the safety of food additives for the last 10 years . . . in the manner only recently required by law.

Since passage of the 1958 Food Additive Amendment and the Delaney Clause we have come to be faced with a situation that has become controversial in nature because certain basic elements necessary to sound legislation are lacking in the Delaney Clause and have not been provided in the regulations issued since passage of the bill.

We find ourselves entangled in a complexity of uncertainties, unknowns, and fanatical attitudes surrounding cancer.

In our confusion and fear of the consequences I am of the opinion that many people have been much too hasty in their accusations or insinuations that certain groups and individuals have not continued to demonstrate good judgment. We must remember that in any successful organization there must be a consistency of policy dictated by the power in command which must be followed by all the subordinate officers whether it be right or wrong.

Basically, I do not think there is much controversy over the major objective. We are all agreed that we need legislative control to require *all* food producers to conform with certain practices which will insure a continuing adequate supply of *safe food* to the consuming public in continuously increasing amounts in the form and condition which the continuously changing public demand dictates.

In these early days of feeling our way and learning to live with our initial attempt to reach this objective, we have lost sight of how much we have accomplished, and our fears have been multiplied as we followed the blind into the confusion thrust upon us at the last moment by the Delaney Clause.

Consider for a moment what would happen if Federal legislation were passed which stated that no one could purchase a new automobile until they demonstrated their ability to drive the new one in a manner such that they would never injure or kill a pedestrian nor cause an accident under any condition.

Fundamentally, all of the obvious shortcomings in such a regulation are present in the Delaney Clause. Keep this in mind as we review some facts.

**Fact 1.** Everyone will agree that the word cancer arouses a greater sense of fear in the average person's sense of well-being than any of the other potential hazards-to-life he faces today.

**Fact 2.** Our biological scientists are unable to describe the initial mechanism of carcinogenesis, but they can recognize the early pathological changes which result when the process becomes active.

**Fact 3.** The known carcinogens, relatively few in number, are used by the experimental investigator as positive controls in his studies. By use of certain dilutions of these materials he can *predict quantitatively the incidence of*

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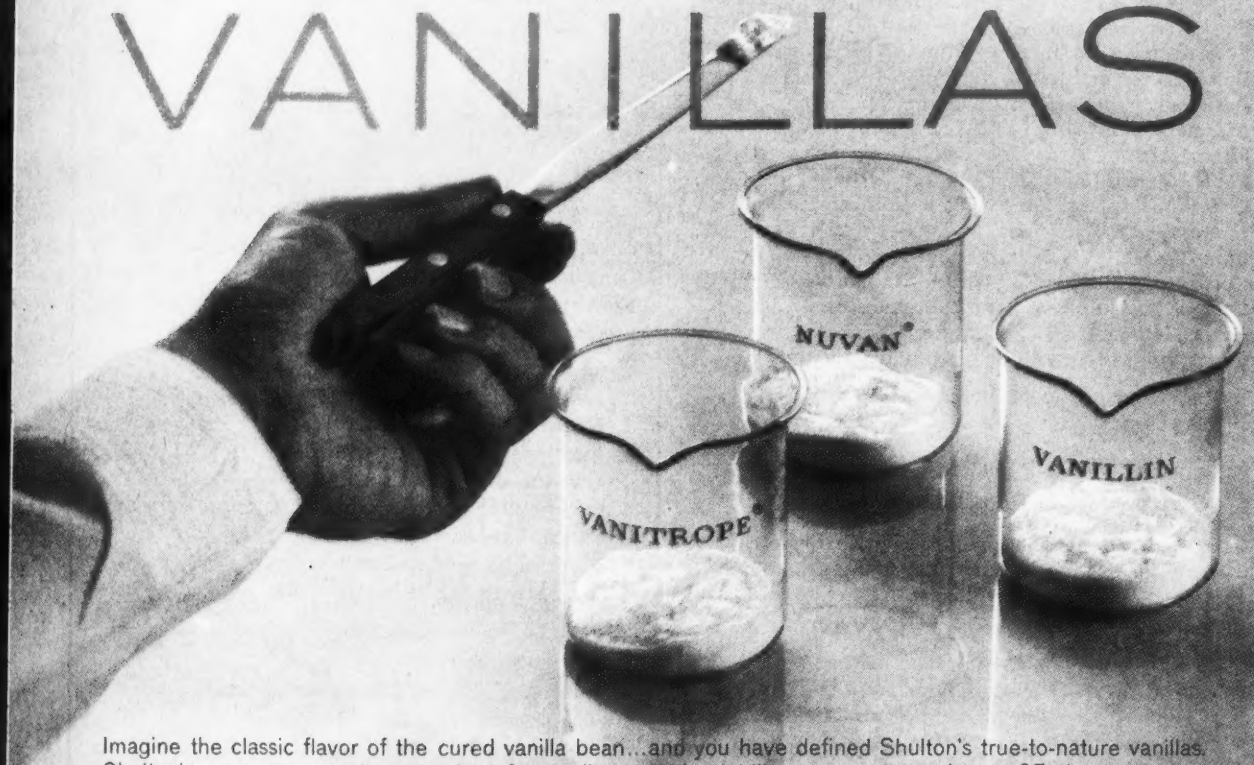
# SHULTON VANILLAS

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THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE
FOOD PROCESSING
MAY 1960
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### A timely and provocative reappraisal suggesting . . .

# A basis for revising food additive legislation

**We should have absolute confidence that the *majority opinion* of expert toxicologists will be in the best public health interests; we should therefore proceed to give the majority opinion official status.**

**Until the dispute over the Delaney Cancer Clause is settled we must maintain at all costs public confidence in both our food supply and in the integrity of its public servants.**

**NORMAN G. WHITE, PhD**
Manager, Industrial Hygiene
Shell Chemical Company

Dr. White has been intimately involved in establishing the safety of food additives for the last 10 years . . . in the manner only recently required by law.

Since passage of the 1958 Food Additive Amendment and the Delaney Clause we have come to be faced with a situation that has become controversial in nature because certain basic elements necessary to sound legislation are lacking in the Delaney Clause and have not been provided in the regulations issued since passage of the bill.

We find ourselves entangled in a complexity of uncertainties, unknowns, and fanatical attitudes surrounding cancer.

In our confusion and fear of the consequences I am of the opinion that many people have been much too hasty in their accusations or insinuations that certain groups and individuals have not continued to demonstrate good judgment. We must remember that in any successful organization there must be a consistency of policy dictated by the power in command which must be followed by all the subordinate officers whether it be right or wrong.

Basically, I do not think there is much controversy over the major objective. We are all agreed that we need legislative control to require *all* food producers to conform with certain practices which will insure a continuing adequate supply of *safe food* to the consuming public in continuously increasing amounts in the form and condition which the continuously changing public demand dictates.

In these early days of feeling our way and learning to live with our initial attempt to reach this objective, we have lost sight of how much we have accomplished, and our fears have been multiplied as we followed the blind into the confusion thrust upon us at the last moment by the Delaney Clause.

Consider for a moment what would happen if Federal legislation were passed which stated that no one could purchase a new automobile until they demonstrated their ability to drive the new one in a manner such that they would never injure or kill a pedestrian nor cause an accident under any condition.

Fundamentally, all of the obvious shortcomings in such a regulation are present in the Delaney Clause. Keep this in mind as we review some facts.

**Fact 1.** Everyone will agree that the word cancer arouses a greater sense of fear in the average person's sense of well-being than any of the other potential hazards-to-life he faces today.

**Fact 2.** Our biological scientists are unable to describe the initial mechanism of carcinogenesis, but they can recognize the early pathological changes which result when the process becomes active.

**Fact 3.** The known carcinogens, relatively few in number, are used by the experimental investigator as positive controls in his studies. By use of certain dilutions of these materials he can *predict quantitatively the incidence of*

*malignancies* he expects to find.

**Fact 4.** He can also predict that in certain species of animals cancer will be present to a certain extent at a given age and in some cases will cause 100 percent mortality in all animals not succumbing to other causes, even when maintained in an environment considered to be completely free of carcinogenic substances.

**Fact 5.** Facts 2, 3, and in part 4, also hold true for substances which damage the liver, kidney, cardio-vascular, and hematopoietic systems.

**Fact 6.** It is not necessary to assume that the increased incidence of cancer is being *caused* by some substance or group of substances (not heretofore in our environment) that man is consuming, breathing, or exposed to in any other manner. There is a more logical explanation.

No one can deny that for every 1000 births we will eventually record 1000 deaths from one cause or another. Automobiles are not killing people as fast as our biological scientists are finding methods to prevent death from tuberculosis, pneumonia, and other disease entities. Therefore, more people are living long enough to develop cancer and cardio-vascular insufficiencies.

Our vital statistics reflect this "shift" in the cause of death as our life-expectancy has increased. (Some will contest this explanation; in any event, some will take the position that these circumstances are all the more reason to be super-cautious.)

**Fact 7.** Our continuing advancement in food production, preservation, processing, and packaging is the only solution to the problem of providing an adequate food supply to man *world wide*. Over half of the people on the face of this earth *today* go to bed hungry.

The surplus we have in this country inhibits our recognizing the critical need for continuing progress in food production, preservation, processing, and packaging. Only because of past accomplishments in these areas do we have such an abundance in this country at the present.

**Fact 8.** An automobile is recognized today as a potentially lethal weapon when used improperly. They killed over 40,000 people last year. However, we don't say you can't drive an automobile; we don't find out which specific make kills the largest percent of the 40 thousand and say production of this must be discontinued.

We do say you should drive more slowly, and we put up speed limit signs which indicate the legal speed permitted.

Good judgment is expected and given to the establishment of speed limits commensurable to the hazard even though everyone recognizes the fact that someone may be killed at almost any moment almost anywhere. We take this reasonable risk as a sacrifice to progress.

**Fact 9.** At the present time our knowledge does not permit our experts to make predictions with regard to carcinogenicity with 100 per cent assurance that they are absolutely correct, but *we can have absolute confidence that a majority of any given group will exercise their best scientific judgment in evaluating the facts in their possession and render a decision in the best interest of, not only our own public health and economy, but also that of the world.*

**Fact 10.** Our technicological progress in food processing should not be slowed down because of the attitudes of a few dedicated fanatics with so little confidence in their own scientific knowledge and capabilities that they are afraid to make decisions today for lack of infallible proof. *Anyone who contends you should accept only that which has been proven beyond a doubt as fact and limit your activity to such areas is not a scientist.* If left to these people, the advancement of our civilization would come to a grinding halt.

**Fact 11.** Industry cannot continue to direct millions of dollars into research programs to find better food additives, insecticides, weed-killers, nematocides, fumigants, medicants in animal feeds, and the numerous beneficial chemicals applicable to food processing, when the ultimate success of such efforts depends upon the *attitudes* of a few individuals who may have difficulty exercising scientific objectivity.

• Three distinct steps are indicated to correct the existing condition.

First: Our legislative officials must be informed. They must understand the deficiencies in the present law and in the way it has been administered.

Second: A satisfactory alternative must be developed.

Third: The Congress must revise the present legislation.

The development of an alternate plan can be accomplished by the selection of a group of toxicologists from government, academic institutions, and industry; *charging them with the responsibility of submitting a firm recommendation based upon a majority opinion,* with the understanding that it is recognized that they do not possess all of the answers they would like to have at the present time.

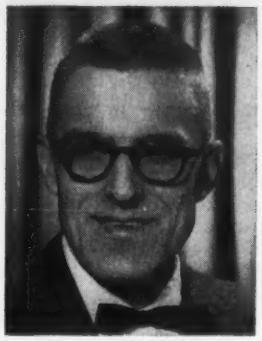
In summary, the divergence of opinions and attitudes manifested by scientists since the passage of the 1958 Food Additive Amendment with the hastily appendaged Delaney Clause points to the need for corrective measures. Certain related philosophical facts have been presented with the hope that they may help point the way to a resolution of the controversy.

Pending settlement of the dispute, a *modus vivendi* must be maintained; that is, we must operate in a manner so as to maintain at all costs the confidence of the American public in both the safety of its food supply and the integrity of its public servants.

# Congress considers

- **Last month's scientific panel discussion on the Delaney Cancer Clause before the House Committee on Foreign and Interstate Commerce brought out the necessity for use of the best possible scientific judgment in its administration.**

- **The hope now is that the per se concept of the cancer clause will be modified and require the HEW Secretary to take into account the scientific judgment of a representative committee of toxicological experts qualified to pass judgment on matters pertaining to safety.**



**HOWARD P. MILLEVILLE**
Editor

# amending Additives Law

LAST month a Scientific Panel of thirteen distinguished experts (see list at right of photo below) on cancer and food protection met and testified at the request of Rep. Oren Harris, Chairman of the House Committee on Foreign and Interstate Commerce.

Specifically under consideration by the panel was the Delaney Cancer Clause in the proposed color additives bill. Rep. Harris indicated, however, that any important modification of this cancer clause would also be proposed for the Food Additives Law, which contains a similar clause.

Hopes that this Scientific Panel would come to some sort of an agreement which would serve as a guide to the lawmakers were frustrated. The scientists testifying as individuals publicly demonstrated a wide divergence of views.

But as a critical observer seeking clues for a way out of the current dilemma, we came to a rather surprising conclusion: the current confusion and consternation of industry over FDA's administration of the Delaney Clause might have been avoided if the "Referral to Advisory Committee" provision had not been deleted from the bill which became the Food Additives Law.

More important, this conclusion points to the (scientific) Advisory Committee, *properly used,* as a means for resolving scientific controversey and legislative confusion.

Those who still oppose the Advisory Committee provision maintain with some measure of justification that this position on our part is wishful thinking. Some of their criticisms lead to our suggestive modifications in the Advisory Committee provision to make it more workable, as described later in this article.

One inescapable observation of the hearing was the wide differences of opinion of the scientists on the panel in legislative matters related to cancer. Another observation was that the scientists on whose advice the HEW Secretary has relied on in his administration of the Delaney Clause, all had extreme views about keeping any possibly suspected carcinogen out of our food supply.

That the Secretary should refer for advice to these scientists at the National Cancer Institute is certainly a justifiable action. The distinguished scientists at the government-operated-and-supported National Cancer Institute of the National Institutes of Public

Members of the Scientific Panel which discussed the Delaney Cancer Clause are in the front row facing the House Committee on Foreign and Interstate Commerce

**From left to right:**

**Dr. M. R. Zavon**
Kettering Laboratory of
Industrial Health

**Dr. Albert Tannenbaum**
Medical Research Institute
Michael Reese Hospital

**Dr. James A. Miller**
McArdle Laboratory
University of Wisconsin

**Dr. Morton L. Levin**
Roswell Park Memorial Institute

**Dr. Floyd De Eds**
U.S. Department of Agriculture
Western Utilization Laboratory

**Dr. Harold F. Blum**
Department of Biology
(also Nat'l. Cancer Institute)
Princeton University

**Dr. William J. Darby**
Chairman of the panel
Department of Biochemistry
Vanderbilt University School
of Medicine

**Dr. Paul R. Cannon**
Professor Emeritus
Dept. of Pathology
University of Chicago

**Dr. Charles J. Kensler**
Department of Pharmacology
School of Medicine,
Boston University

**Not shown in photo**

**Dr. G. Burroughs Mider**
Associate Director,
National Cancer Institute
National Institutes of Health

**Dr. Walter S. O'Donnell**
Sloan-Kettering Institute for
Cancer Research
Division of Preventive Medicine

**Dr. Harold L. Stewart**
National Cancer Institute
National Institutes of Health

**Dr. Philippe Shubik**
Division of Oncology
Chicago Medical School

# Congress considers amending Additives Law

Health would at first appear to be best qualified.

It has now come to be realized, however, that their background as experimentalists in cancer research is in many ways by itself inadequate for the perspective and scientific judgment needed in the administration of a cancer clause.

The objective of most of the experimental work at the National Cancer Institute as well as that of other cancer specialists

Rep. Oren Harris (D, Ark.), Chairman of the House Committee on Interstate and Foreign Commerce, is second from the left; Rep. John Bell Williams (D, Miss.), a key figure in the passage of the 1958 Food Additives Law, is on the left. The three members of the Scientific Panel facing the congressmen are (left to right) Dr. Harold F. Blum, Dr. William J. Darby, Chairman of the Panel, and Dr. Paul R. Cannon

is to determine the cause and cure of cancer. In pursuit of this objective these cancer investigators try to induce cancer as rapidly as possible, then seek ways of curing it.

An additional consideration is that most, if not all, of their experimental studies are based not on cancer caused by ingestion as would be the case of possible carcinogens in our food supply, but on cancer caused by physically injecting substances into the body, painting substances on the skin, or introducing them into the air breathed by the test animal.

These cancer specialists thus deal primarily with powerful carcinogens, using them as tools in their studies.

In the case of possible food additives, the scientific judgment required is at the other end of the cancer phenomena spectrum. Any substance which resembles a powerful carcinogen to humans under conditions of use would never be considered as a food additive.

There is a striking-if-somewhat-oversimplified analogy between the per se doctrine as it once was applied to poisons in general and the present status of its application to carcinogenic substances.

Disregarding these latter substances for the moment, it eventually became recognized that any component, whether it be natural or synthetic, when consumed in excess by either a test animal or humans, exerts harmful effects; therefore has the capacity to be poisonous.

The objective of the government has been to prevent strong poisons from becoming a part of our food supply and limit the possible new components of the diet to those substances having only a weak capacity for being poisonous, i.e., those which when tested on animals under conditions more or less reasonably related to expected use in humans do not exert harmful effects.

Now consider the special class of poisons classified as carcinogenic. At the present time most of our limited knowledge is on strong carcinogens.

But hardly a month goes by without a report on the finding of a new weakly carcinogenic staple in our food supply. Two of the latest reports demonstrate that under extreme conditions—not at all reasonably related to usuage by humans—eggs and ordinary table salt increase the incidence of cancer in test animals.

### Delaney Clause unworkable

It thus appears that in the hands of the experimental toxicologist *practically any component of the diet can be made to increase incidence of cancer in test animals.* When such results are considered under the Delaney Cancer Clause, the item in question comes to be classified as carcinogenic.

Such a clause thus becomes unworkable for judging the safety of new substances unless it is the desire of Congress to stop practically all progress in food additives.

At this date it is beside the point to argue that the Delaney Clause does not preclude the use of scientific judgment on the part of the Secretary. The point is that there is considerable disagreement over the type of scientific judgment that has been exercised.

Industry's objective in proposing modifications in the cancer clause is to provide for the best possible scientific judgment so as not to stifle technological progress.

We believe that the problem can be unraveled step by step, but that it wil first be necessary to eliminate the per se concept from the cancer clause. We also believe that a scientific Advisory Committee should be provided for to help interpret the points in the modified cancer clause requiring exercise of scientific judgment.

Specifically, it is suggested that the cancer clause be modified to read: " . . . provided that no substance shall be deemed safe if it is found to induce cancer in man or animal when ingested by man or animal in amounts and under conditions *reasonably* related to the intended use, or if it is found after tests which are *appropriate* for the evaluation of the safety of additives for use in food to induce cancer in man or animal.

Concomitant with this modification of the cancer clause we suggest providing for the use of the Advisory Committee, but only for actions of the Secretary which would come under the cancer clause.

One question that immediately arises is how can we expect a commitee which is or should be representative of all the pertinent scientific disciplines to come to any sort of agreement when they hold such widely divergent views.

This leads to the suggestion that the committee be required to submit a report which represents the prepondernace of opinion of the committee. A provision should also be made for a minority report should the minority desire to submit one.

In any event, neither report should be binding on the Secretary but would, of course, be part of the entire record.

At this time we would like to point out that the divergence of viewpoints which might be expected from members of such a scientific Advisory Committee will be narrowed if not entirely eliminated in action.

In this regard it is worth considering again the recent testimony of the Scientific Panel before the House Committee on Foreign and Interstate Commerce.

It is true that the scientists were poles apart on such policy matters as whether or not a cancer clause is required in the law, and what tests are generally appropriate for the evaluation of safety.

But we state with conviction that if, for example, this scientific Panel were asked to pass judgment on experimental data regarding the proposed use of a specific additive, they would come to reach substantial—if not unanimous — measure of agreement.*

In line with the stand Dr. N. G. White takes in the article which precedes this one, we should have absolute confidence that the preponderance of opinion of a group of qualified experts will be in the best public health interests in all cases where it is necessary to weigh the possible health hazard against the economic need.

TO NEXT PAGE

*If my notes are correct, a similar conclusion was actually stated at the hearing by Dr. Mider of the National Cancer Institute.

### Re the Advisory Committee

The provision for Reference to an Advisory Committee which was deleted from the bill just a few weeks before it became law is reprinted in its entirety at the end of this article.

It is pertinent to note that it was deleted from the bill when the Delaney Cancer Clause was not included. This clause subsequently was added to the bill and became part of the Food Additives Law.

Examination of the record of Hearings during the 84th and 85th Congress shows that legal opinion was mostly against the use of the Advisory Committee. This opinion brought up to date is tersely summarized as follows: The fact that government is not exercising good, correct scientific judgment does not offer any sound reason for delegating government functions to an advisory group.*

But at least a few legal experts are becoming resigned to another fact — that we don't practice food and drug law like we do damage suits.

In any event, a food processor whose existence depends on consumer confidence in his products simply cannot afford the adverse publicity which would result from contesting in court the decisions of the Secretary under the cancer clause.

Therefore it seems all the more necessary that the Congress specifically make provisions for the best possible scientific judgment in the administration of the law.

In defending the provision for Referral to an Advisory Committee, the FDA Administrator said* ". . . [it] was proposed in an effort to give industry the same opportunity of getting a scientific question reviewed by an independent group of recognized scientists that the Department now has. . . . The [National] Academy [of Sciences] was established to advise Government on such matters. We are willing for industry to have the same opportunity."

After consulting with more than a dozen experts on this matter, most of whom are well versed in the workings of a similar provision under the Miller Pesticide Law of 1955 . . . and after consideration of a wide assortment of opinions and criticisms, we conclude that a more useful and therefore a more acceptable Advisory Committee would result if certain changes were made in its makeup and operation.

For purposes of further discussion the following modifications are suggested:

a. As previously suggested, the Advisory Committee provision would apply only to actions of the Secertary taken under the cancer clause.

b. To secure continuity in action it is suggested that the Advisory Committee consist of a core of permanent members — the seven members of the already functioning National Research Council's Subcommittee on Carcinogenesis. Other members of the Advisory Committee would be separately appointed for each referral as described in paragraphs (c) and (d) below.

c. To prevent the lobbying activities encouraged by the last sentence of Section 1 in the provision for Referral to Advisory Committee, we would delete this sentence. In its place we suggest that the industry whose petition is being considered be allowed to appoint a scientist as a non-voting member who would represent the industry in the deliberations of the Committee. (The FDA has continuity of representation in the core of permanent members, since one of the members of the NRC's Subcommittee on Carcinogensis comes from FDA.)

d. Additional members, say five in number, should be appointed by the Secretary in accordance with the provisions previously proposed, except that insofar as is possible at least two of these should have special experience in the type of carcinogenity involved in the referral.

e. The Advisory Committee should also be provided by the Secretary with adequate secretarial help for making a transcript of their deliberations for their own use; they should also be provided with legal counsel. Furthermore, the Committee should be authorized to seek the advice of legal counsel other than that which the Secretary provides if it so desires.

f. The report which the Committee makes to the Secretary should represent the preponderance of opinion of the members of the Committee; the minority opinion, if there is one, should also be authorized to submit a report to the Secretary. END

*As recently stated by one who commands considerable respect in food and drug law.

*George Larrick in Hearings on Food Additive legislation before the 85th Congress.

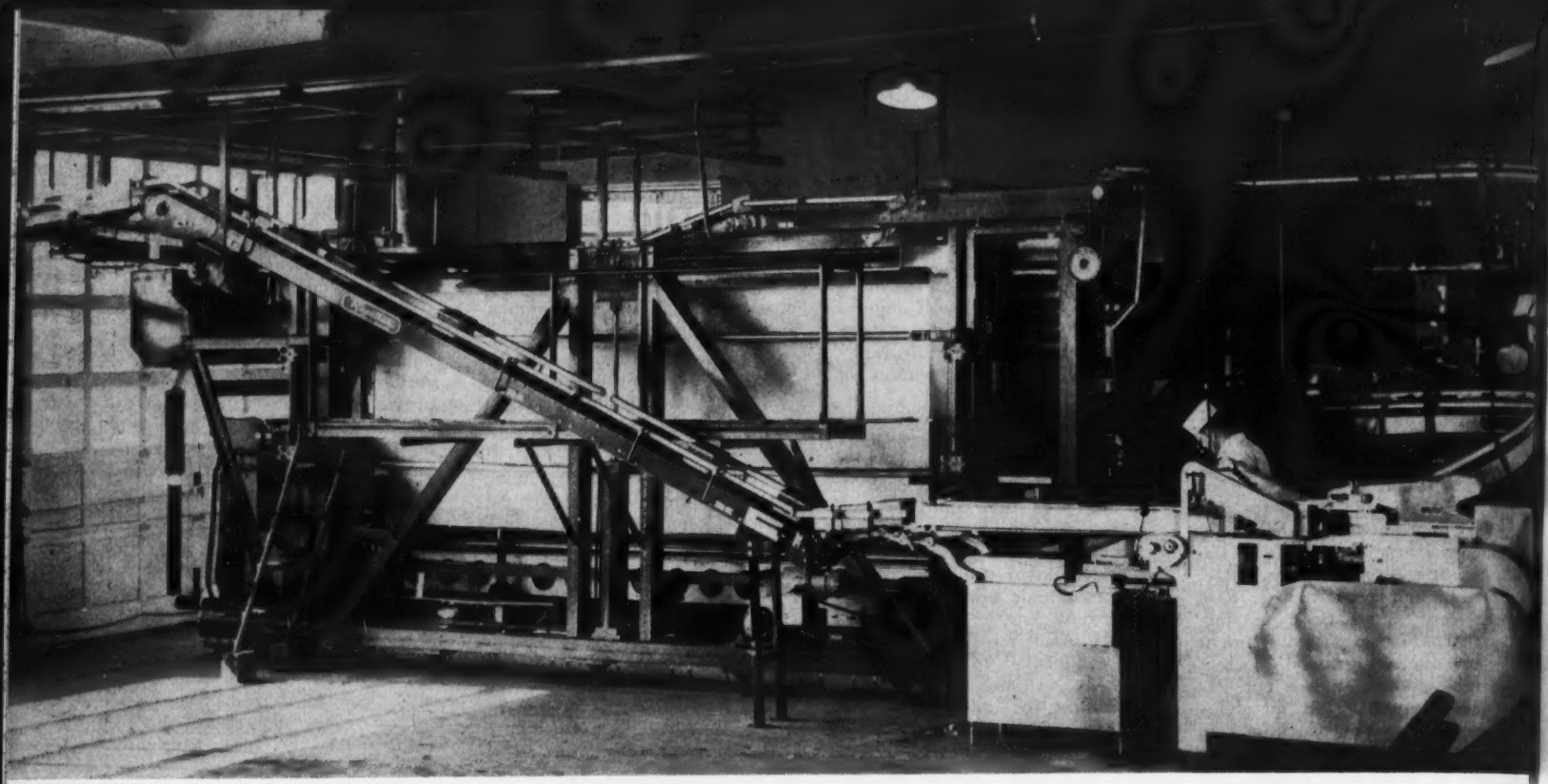
## Reference to Advisory Committee

**The following FDA-sponsored provision, taken from House Report 2284, July 28, 1958, was deleted from the Food Additives bill before it became law**

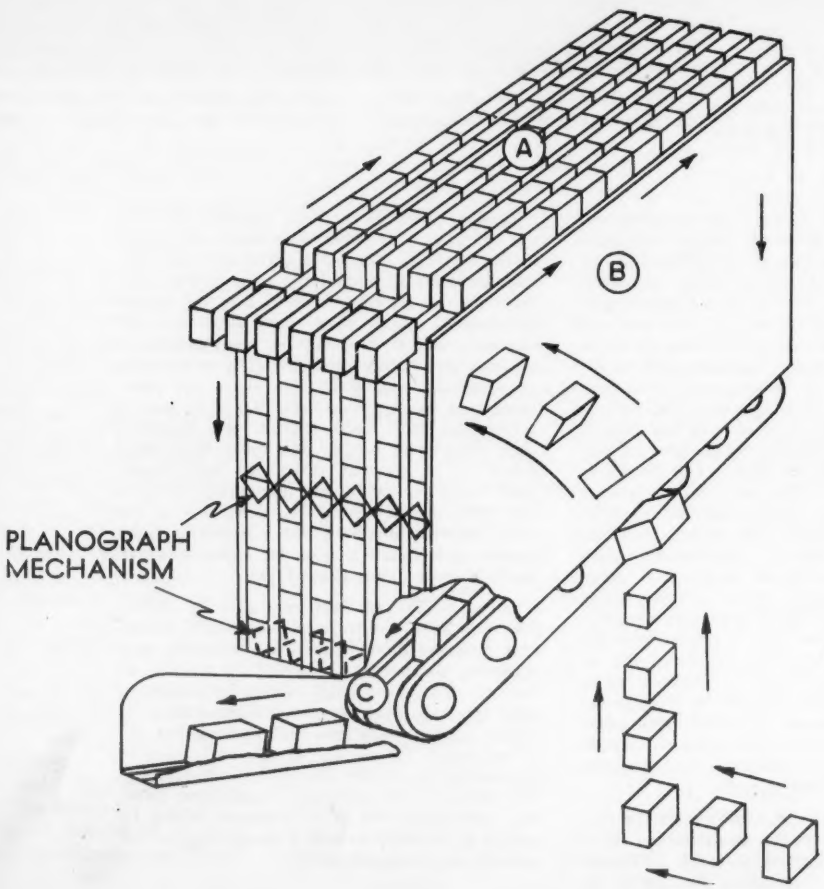
(1) At any time before, or within thirty days after, publication of an order issued under subsection (c) or (d) of this section, the petitioner may request that the petition or order thereon, or the Secretary's proposal, or any question raised by such petition, order, or proposal, be referred to an Advisory Committee. Upon such request, or if the Secretary within such time deems such a referral necessary, the Secretary shall forthwith appoint an Advisory Committee of competent experts to review the petition, order, or proposal, or question, as the case may be, and to make a report and recommendation thereon. Each such Advisory Committee shall be composed of experts, qualified in the subject matter of the petition, order, proposal, or question, as the case may be, and of adequately diversified professional background selected by the National Academy of Sciences, except that in the event of the inability or refusal of the National Academy of Sciences to act, the Secretary shall select the members of the Committee. The size of the Committee shall be determined by the Secretary. Members of an Advisory Committee shall receive as compensation for their services a reasonable per diem, which the Secretary shall by rules and regulations prescribe, for time actually spent in the work of the Committee, and shall in addition be reimbursed for their necessary traveling and subsistence expenses while so serving away from their places of residence. The members shall not be subject to any other provisions of law regarding the appointment and compensation of employees of the United States. The Secretary shall furnish the Committee with adequate clerical and other assistance, and shall by rules and regulations prescribe the procedure to be followed by the Committee. The Secretary shall refer the petition, order, or proposal, or question, as the case may be, to the Advisory Committee so appointed, and furnish such Committee all the data before him. A person who has filed a petition or who has requested the referral of an order, proposal, or question, to an Advisory Committee, as well as representatives of the Department of Health, Education, and Welfare, shall have the right to consult with such Advisory Committee in connection with the matter referred to it.

(2) Within sixty days after the date of such referral, or within an additional thirty days if the Committee deems such additional time necessary, the Committee shall, after independent study of the data furnished to it by the Secretary and other data before it, certify to the Secretary a report and recommendations, together with all underlying data and a statement of the reasons or basis for the recommendations. Within thirty days after such certification, and after giving due consideration to all data then before him, including such report, recommendations, underlying data and statement, and to any prior order issued by him in connection with such matter, the Secretary shall confirm or modify any order theretofore issued or, if no such order has been issued, shall by order establish a regulation prescribing, with respect to any particular use of the food additive involved, the conditions under which such additive may be safely used or shall, by order, deny the petition.

(3) The Secretary may by regulation condition referrals to Advisory Committees pursuant to this subsection upon the payment, by the person requesting the referral, of fees to defray the costs arising by reason of such referrals. Such fees, including advance deposits to cover such fees, shall be available, until expended, for paying (directly or by way of reimbursement of the applicable appropriation) the expenses of Advisory Committees under this subsection and other expenses arising by reason of referrals to such Committees, and for refunds of excess payments.



Installation of packaged freezer is in area formerly used for loading trucks. From wrapper, right foreground, ice cream cartons travel through garage-type door into transport or delivery truck outside




## Freezer loads & unloads every 5 min open time of plates is less than 5 sec

When ready-rails on top of unit are fully loaded (A), plates open slightly, controlled by vertical and horizontal planographs at front and back of freezer. Elevators under each channel raise the 13 layers of cartons shearing any adhesion pick up layer from ready-rails, and lower the 14-layer loads into freezing channels to a level where bottom frozen layer is below plate (B). Cross shear mechanism at bottom clears adhesion between cartons. Elevators continue their downward motion, lowering frozen layer to discharge position. Discharge belts on each elevator eject frozen packages, six at a time (C). Although feed and discharge are on cycle basis, freezing surfaces of machine are exposed to surrounding relative humidity and temperature for less than five seconds per cycle.

Because of very short duration of exposure, frost formation is avoided. Vertical-plate freezer can therefore be used in any location where conveyors, refrigeration and electrical lines can be installed, including outdoors

Soft ice cream cartons are conveyed directly from filler on production floor to vertical feeder-conveyor of freezer and loaded into top from front of unit. Frozen ice cream cartons are discharged at bottom, front; move directly to nearby automatic wrapping machine. Cartons are discharged from wrapper onto conveyor for loading directly into truck or cold storage room

**Compact, vertical-plate freezer makes it . . .**

# Easy to change to continuous freezing

- **No insulated enclosure required**
- **Tests show up to 40% more efficiency**

FP Staff

**PROBLEM:** Half-gallon containers of ice cream are forming an increasing share of sales for Costa Ice Cream Co. at Woodbridge, N. J.

In addition to distributing own brand from plant, truck-load quantities of half-gallon containers are shipped to Grand Union Stores.

After filling, the containers were stacked in a hardening room, then loaded into truck. Production had reached a point where mechanizing the hardening operation would be advantageous.

**Solution:** With a minimum of alterations a vertical-plate freezer was installed to harden the ice cream on a continuous basis.

This type of freezer needs no insulated enclosure. At Costa, it was installed in a truck loading area next to the ice cream production department, see photo and flow diagram.

Conveyors feed the freezer, move discharged cartons to nearby automatic wrapper, then transport cartons either directly to trucks or to cold storage room.

Wrapper bands two ½-gal cartons together with wrapping material fed from a roll and glue-seals the 1-gal package.

When trucks or trailers are loaded, product flow is continuous from filling machine to vehicles.

One man places cartons in filler. The next and last station at which a man is needed in complete operation is in truck for stacking or palletizing packages. Man is in truck only half the time since it only takes about 2½ minutes to load 5-minute output from freezer (72 gallon-packages).

Speed of whole operation at Costa is keyed to production rate of freezer—over 1600 half-gal cartons per hour.

Freezer is unitized, all auxiliary equipment such as motors, drives and hydraulic press being enclosed within the body of unit.

Location of freezer in plant can be readily changed since unit is skid mounted and weighs 38,000 lb. It is simply connected to plant electricity; connections to suction and liquid lines of plant refrigeration system are by flexible tubing.

Further, machine requires little space, only 21 ft by 7 ft in floor area and 10 ft in height.

Cartons, as described under operations, travel through freezer in downward stages between low-temperature, vertical, contact plates. Plates, by means of uniform pressure supplied by a hydraulic pump, are kept in intimate contact with cartons.

Cartons cycle through machine with their two largest sides in contact with the vertical plates, see drawing below. Heat exchange thus occurs in two directions over two largest sides of cartons.

Vertical plates are made up of series of 56 rectangular tubes welded together and to headers at top and bottom. They are 65 in. high and 168 in. long.

There are seven such plates in freezer and they form six channels through which cartons feed. Plates provide machine with total of 910 sq ft of surface area.

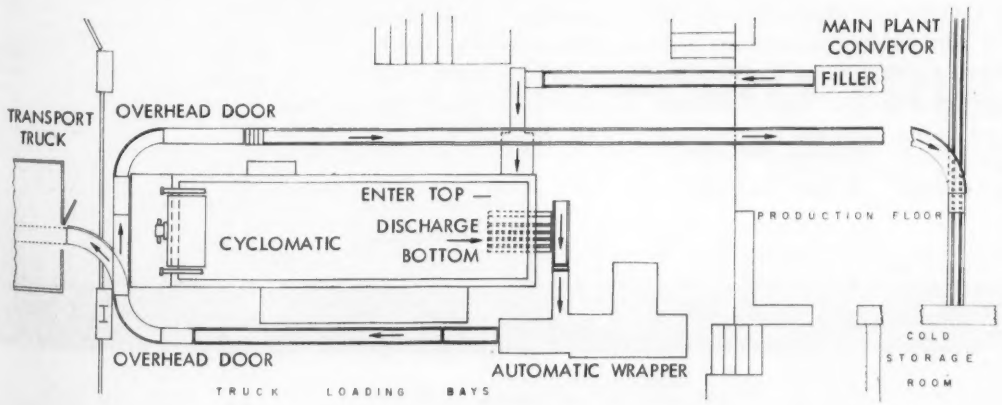
Using freezer plates in vertical rather than in horizontal plane eliminates insulation effect in two places: air that has been left as head space in horizontal cartons, and refrigeration gas that has accumulated near top of lower, horizontal freezer parts.

Small temperature differential between refrigerant in evaporator and outside surface of product package, plus plate design and pressure contact contribute to high operating efficiency.

Tests and economic studies indicate efficiency up to 40 per cent greater than most commercial freezers is obtained.

**Operation:** At Costa's, freezer cycles every five minutes. That is, 12 times per hour one layer of 144 cartons is fed into machine and one layer is discharged.

Time for loading and discharging is kept to minimum because ready-rails directly




*(Freezer which Costa Ice Cream Co. installed is not sold but leased at present. Information on leasing arrangements, which are based on food processor's annual volume, can be obtained from Cyclomatic Freezing Systems, Div. of The Texstar Corp., 237 Lancaster Ave., Devon, Pa.)* 7156 on Reader Service Slip.

*(The automatic carton accumulator and bundler used by Costa is manufactured by Hayssen Manufacturing Company, Sheboygan, Wis.)* 7157 on Reader Service slip.

over freezing channels accumulate a full layer of cartons while plates are closed on layer being frozen.

Accumulation of the 144 cartons is by continuous feed which pushes six cartons at a time, 24 times every five minutes, into ready-rails above channels. When rails are full, plates open slightly and machine cycles, see photo and caption.

Up-action of elevators at beginning of cycle shears any

**Mobile pilot plant is used in running tests to establish anticipated rate of production in potential installations**

adhesion between cartons and freezing plates. Near end of cycle, cross shear mechanism at bottom clears any adhesion that may exist between layer to be discharged and bottom layer still between plates.

Rate of infeed and freezing cycle can be set to match speed of filler to provide continuous flow. Belt discharge of frozen layer can also be accelerated to provide rest time for loaders or palletizers.

Freezer requires about 15 hp for one hour while plates are being loaded; requires about 4 hp per hour during balance of day.

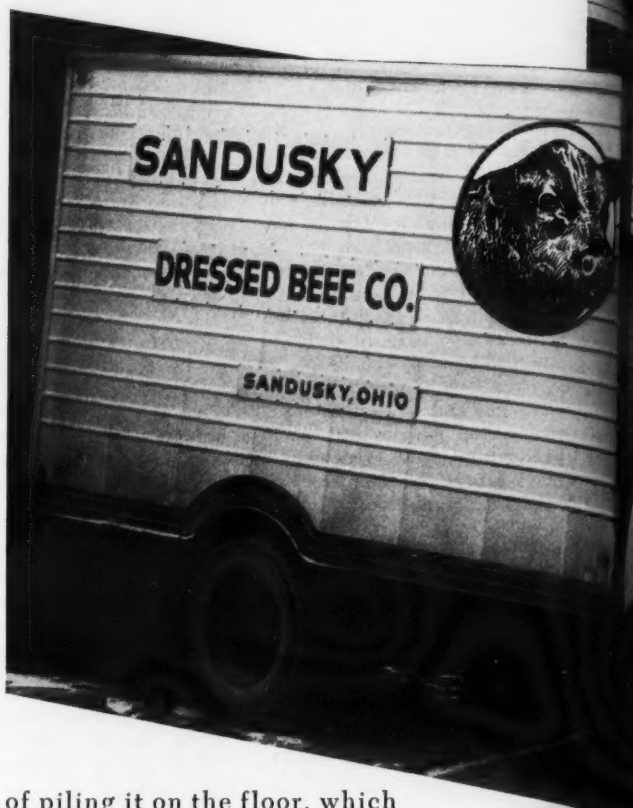
**Results:** Fast freezing rate (about 1 hour) causes formation of fine microcrystalline structure which aids in producing a product of high quality or smoothness.

Costa Ice Cream Company has found that bypassing hardening room and loading directly saves crew of 4 men who normally take about 3 hours to load a trailer.

Further, direct loading eliminates the eight-hour delay in hardening room plus at least two handlings. It ex-


# "In over 1,000,000 miles we've rebuilt only one rear axle in our Ford Fleet!"

*SAYS W. P. ALLENDORF*
*VICE-PRESIDENT*
*SANDUSKY DRESSED BEEF CO.*
*SANDUSKY, OHIO*




"Carrying 5 to 6 tons of beef in heavy refrigerated bodies calls for extra-sturdy and reliable trucks. We've used Fords since 1949, and are now 100% Ford. Their big-capacity front and rear axles plus strong frames do a fine job of handling our heavy loads.

"In our business we can't afford road failures, and that's why we buy durable Ford Trucks. Some of our '54 and '55 models have from 200,000 to 220,000 road miles . . . far more than that in actual engine miles. Once the trucks start out we never shut off the engine. It is always idling when we are making deliveries since it must power (P.T.O.) our refrigerator units.

"We now have 15 Ford Trucks from F-600's to C-800's. The newer trucks, and models we are now buying, are C-800's with sixteen-foot refrigerated bodies. These have four rails so we can hang our beef instead of piling it on the floor, which assures delivery of the meat in excellent condition.

"Our trips average about 200 miles within a 90-mile radius of Sandusky. And throughout our territory we like the excellent availability of Ford replacement parts, their low cost and the fine Ford Dealer service."

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FORD **Falcon** RANCHERO

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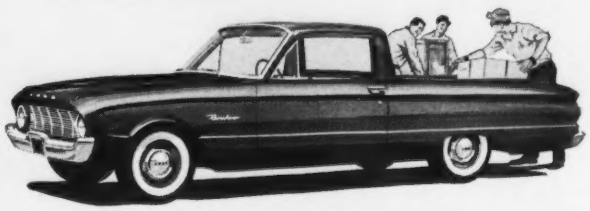

The Falcon Ranchero is priced lower than any pickup in America with comparable standard equipment! And that is just the beginning of your savings. Single-unit construction saves on maintenance . . . it's tighter, quieter, with main underbody structural members zinc-coated against rust and corrosion. Front fenders bolt on, cost less to replace. And Ranchero's passenger-car ride and handling ease lessen driver fatigue.

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**BIG 6-FOOT BOX!**

Capacity is more than ample for most pickup hauls—nearly 8 feet of load length with tailgate flat. And thanks to the low floor height, loading and unloading is faster, easier.

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7. Styled to capture admiration

*Based on a comparison of latest available manufacturers' suggested retail delivered prices with comparable standard equipment

**See the parade of pickups during your FORD DEALER'S TRADING FAIR**

# FORD TRUCKS COST LESS

*LESS TO OWN . . . LESS TO RUN . . . BUILT TO LAST LONGER, TOO!*

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pedites orders and of course saves working capital required to keep product in inventory or storage.

When Costa does find it necessary to store ice cream, hard, uniform packages require 14 per cent less cubic area and can be tightly stacked since no voids must be left for air circulation.

While first commercial application to day is only in ice cream freezing, unit should find application in freezing such other foods as fruits, vegetables, fish, meat and poultry.

For determining suitability of a freezer for any specific product, a mobile simulator (pilot plant) is available, see photo above. It can determine fairly accurately advantages and extent of economics freezing equipment will provide without detailed theoretical analysis.

### "How to do it" maintenance manual

Over 340 plant-practice "how-to" items are presented in this hard-cover book. It was assembled and edited by Robert L. Davidson for men who are charged with keeping a plant in operation.

Tried methods on how to maintain, revamp, and repair processing equipment are presented. Among the problems covered are corrosion, repairs, leaks, and wear on such universal equipment as valves, piping, tanks, drums, heat exchangers, pumps, and towers.

Over 270 drawings and photos illustrate shop made fixtures, jigs and dies, and other tools and methods useful in maintaining equipment in good running order.

These practical subjects are divided into five main sections: managing the job, maintaining the equipment, handling processes and products, protecting equipment, and general equipment. The book is classified and indexed for quick handy reference.

("Successful Process Plant Practices", 293 pp, is available for $10.00 from McGraw-Hill Company, Inc., 330 W. 42nd St., New York 36, N.Y.)

CLARK

**In this 110-acre cavern 'farm' . . . where mushrooms spring eternal . . . and every day is harvest day . . .**

# Mechanization 'Mushrooms' Production Tenfold

**NORB LEINEN**
Associate Editor

In an abandoned limestone quarry carved into a hillside near Valmeyer, Ill., 110 acres of dark, dusty caverns have been transformed into one of the world's largest mushroom farms.

When the Knaust family — old-line New York State mushroom growers — initiated Midwest operations here in 1950, this worked-out quarry was selected because it offered such natural advantages as plenty of room, a constant, mushroom-friendly 55 F temperature and proximity to the major markets of St. Louis and Chicago.

Next step was to improve on nature. Openings were sealed off, doors provided for personnel exit and entry, giant sliding doors for trucks and equipment.

Air chambers, duct work and fans for ventilation were installed. Buildings were erected — some outside, some built into the face of the cave. Even a "standby" cannery was installed, for emergency use.

Yet, despite the natural advantages, the man-made improvements and the special high-quality, high-yield type mushrooms grown, production averaged only 200 lb per day.

Today, Knaust Mushrooms, Inc., averages a daily production of nearly 2000 lb of mushrooms. Main reason for this tenfold spurt in productivity is mechanization.

Lift trucks are the key units. The sizeable fleet includes two fork trucks of 4000-lb capacity, one of 5000-lb capacity and five of 6000-lb capacity.

In addition, company has two 7500-lb-capacity tractor-shovels, a farm tractor (which pulls a string of tracking trailers), hauling trucks for carrying away used compost and a 32-ft, insulated, over-the-road delivery trailer.

Permanently installed job-built equipment includes a compost-turning machine, automatic box-filling machine, automatic casing machine and a dumping machine (for the used compost).

All equipment is propane-burning, since an abundance of carbon-monoxide fumes from diesel or gasoline burning engines would discolor, kill and deform the mushrooms.

Lift trucks and all, life down on the farm was never like this.

(Lift trucks and tractor shovels in use at Knaust Mushrooms, Inc., were manufactured by Clark Equipment Company, Industrial Truck Division, 1921 Escote St., Battle Creek 80, Mich.)
7159 on Reader Service Slip.

*For key steps in mechanized mushroom farming, turn page* ▸

Fork truck removes tier of trays filled with spore-laden compost and pasteurized dirt. Tractor-drawn tracking trailers along far wall will carry trays to "settling" area. At center, automatic casing machine's hopper is being filled with pasteurized dirt by tractor shovel

# Mechanized Mushrooms step—by—step

**Photographic Sequence**

1—Preparing the compost

2—(See photograph preceding pages) Filling trays with top dirt and removing to growing area

3—Stacking loaded trays in growing area

4—Hand-harvesting the mushrooms

5—Loading insulated delivery trailer (Brown Trailer Division of Clark Equipment Company)

1

2
See preceding page

3

4

5

First step is to prepare compost (photo 1). Tractor shovel with tine bucket runs to separate outdoor stockpiles, scoops up racetrack manure, stable manure, Brewer's grain, gypsum and superphosphate in proper proportions.

Dumped into a turning machine, compost is blended and watered over a 14-day composting cycle, then extruded in "windrows," measuring 6½ ft high, 6½ ft wide and 120 ft long. Tractor-shovel then bites off bucketloads of compost and feeds into an automatic machine which fills boxes or trays measuring four ft by eight ft by six in. deep.

Compost-filled boxes are carried by fork lift to one of five pasteurizing rooms where 14-high stacks of boxes are kept under steam for 10 days in temperatures ranging from 150 to 120 F.

Fork trucks then carry boxes to one of three 72 F spawning rooms in the cave where grain spawn is sown into the boxes.

After 21 days, boxes are removed by fork truck and fed into automatic casing machine. Here, pasteurized dirt is spread on top of the spore-seeded compost.

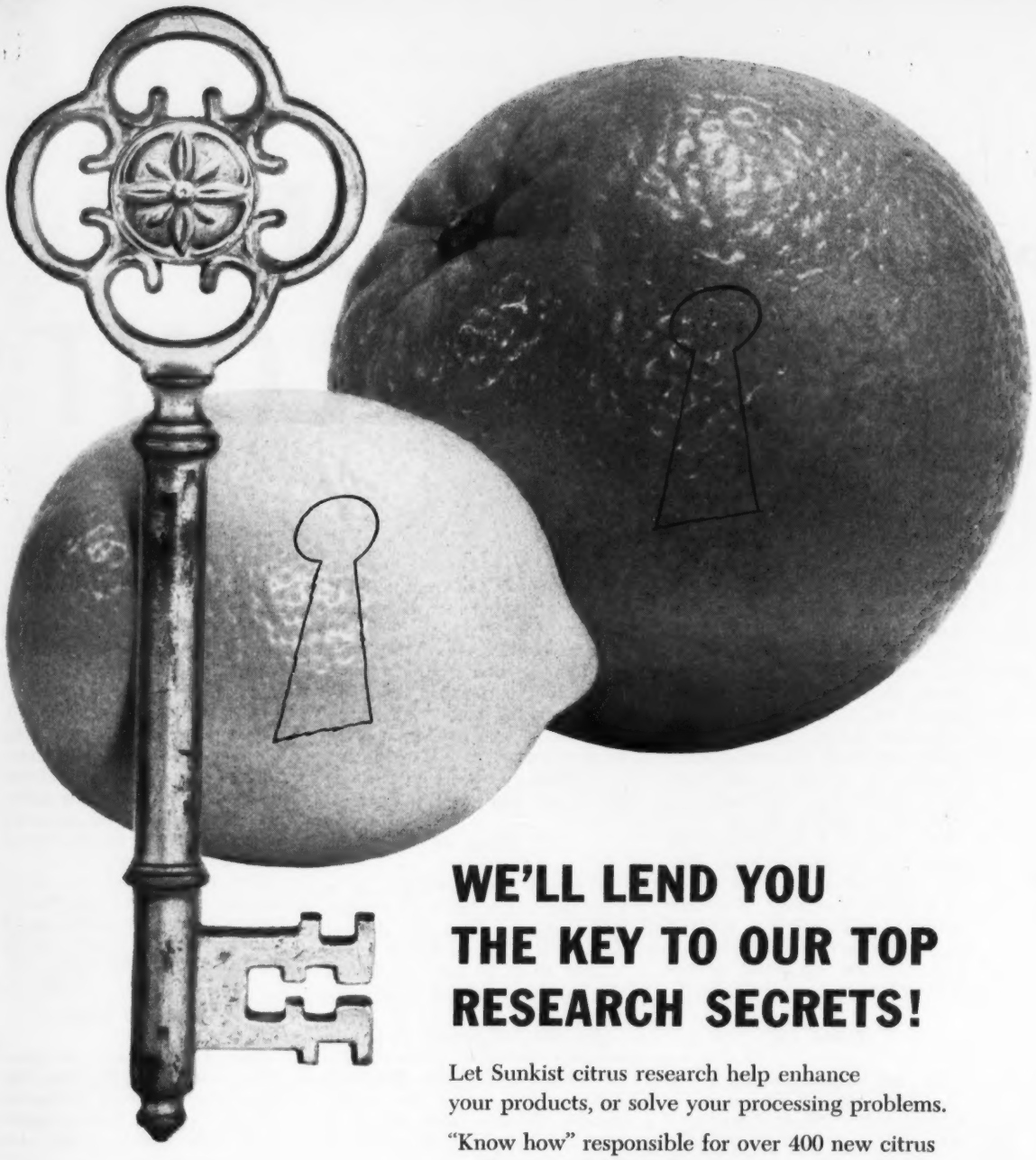
As boxes pass beneath casing machine's hopper they get exactly 1¼ in. of dirt, then are picked off conveyor by another lift truck (see large "cinemascope" photo on preceding pages) and placed one-by-one four or five high onto a string of tractor-towed "tracking" trailers which carry filled trays to the storage or "setting" area.

In storage area, lift truck equipped with side-shifter removes trays from trailer and stacks them in staggered, alternate layers to permit easy hand picking of mushrooms (photo 2). The trays sit for two weeks — being watered occasionally — before the first mushroom bloom appears.

Here, the only manual operation takes place. Female workers in total darkness, with headlamp, gloves and sharp knives, hand pick mushrooms by size (photo 3). The first bloom, and each of two succeeding blooms spaced about a week apart, may last several days. (Actually, "harvesting" goes on continuously as the various mushroom crops throughout the caverns mature.)

After eight weeks, growths become very spotty, so Knaust dumps the trays into hoppers to salvage the compost for use by farmers. Empty trays are towed outside for stacking by fork truck, and stored until filled again the following week. Knaust uses 12,000 boxes in its high-volume operation.

Following temporary storage in the cooler, 30-lb boxes of mushrooms are fork-truck loaded into 32-ft refrigerated trailer (photo 4) which hauls bulk of the crop 800 boxes at a time to a cannery in Collinsville, Ill., and the remainder to fresh markets in St. Louis or Chicago. END



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PART III

# The creeping hysteria of FOOD AND FALLOUT

**The effects of:**

- **carbon 14**
- **cesium 137**
- **short-lived isotopes**

**Plus a positive approach for dealing with the problems as they exist**

**KARL ROBE**
Associate Editor

OUR food supply is a carrier for two other major fallout elements besides radioactive strontium, which was covered last month in part II of this series. These are cesium 137 and carbon 14.

Cesium emits gamma rays which penetrate the entire body. Carbon 14 emissions are short range, rather than long range, as reported in part I, March.

In contrast to strontium's affinity for the bones, both cesium and carbon are distributed throughout the body. For this reason, germ cells as well as body cells are exposed, making both isotopes significant genetically as well as somatically.

### Cesium 137

The half-life of cesium 137 is 27 years, about the same as strontium 90. Plants take up a relatively small fraction of cesium 137 from the soil. The main avenues of entry appear to be from surfaces of vegetation.

The amount of cesium entering the body is much smaller than strontium. Cesium spends only about 140 days in the body, whereas strontium is excreted over a period of years.

Perhaps as much as 50 per cent of the cesium 137 which we eat is assimilated. It is distributed throughout the soft tissues of the body, in contrast to strontium's affinity for bones.

A Japanese study, reported in 1958, indicated that the amount of cesium 137 found in food stuffs in Japan corresponds to internal irradiation of the reproductive organs by gamma rays of 0.07 roentgens in 30 years.

To bring this cesium 137 figure into perspective with natural radioactivity, consider the potassium in the body. This naturally radioactive potassium gives us an exposure of 0.54 roentgens in 30 years — almost eight times the cesium figure.

### Carbon 14

The half-life of carbon 14 is 5,568 years. The last fallout hearings indicated that the amount of carbon 14 in all living things is now 10 to 20 per cent above the level that existed before nuclear testing began.

The effect of present carbon 14 irradiation will be felt genetically for some 8,000 years. Scientists estimate that during this period, genetic damage will result in tens or hundreds of thousands of deaths and deformities.

These estimates are based on the present amount of carbon 14 in the atmosphere.

However, the present increase of 10 to 20 per cent added carbon 14 will drop, in a few years, to about ½ per cent above prenuclear levels, according to Dr. Willard Libby, formerly of the Atomic Energy Commission and now at the University of California at Los Angeles.

This reduction will be accomplished through absorption of carbon compounds from the air by the oceans, with their huge reservoir of non-radioactive carbon.

Thus, the effects of added carbon 14 will correspond to about 1/200th of the effects due to natural background radiation. This subtracts substantial panic value from original estimates on genetic damage from carbon 14.

At the same time, as Dr. Linus Pauling and many others forcefully contend, any small increase means added deaths and suffering. This is a valid argument against further nuclear explosions.

Fortunately, only two aboveground explosions (by France) have occurred since the last US tests in October, 1958 and the Russian tests of November, 1958.

### Short-lived fallout

The initial burst of fallout which results (largely downwind or eastward) after a nuclear explosion contains several short-lived radioisotopes of interest to food processors.

These include iodine 131 with half-life of 8.1 days; barium 140, half-life 12.8 days; and strontium 89, half-life 53 days. Each of these isotopes is monitored under the US Public Health program, which also checks strontium 90 and cesium 137.

In comparison with strontium 90, about 160 times as much strontium 89 activity is produced by fission (uranium) reactions.

While the half-life is short, strontium 89 can result in appreciable elevation of radioactivity in the bones of small and unborn children during the few

Continued on page 42



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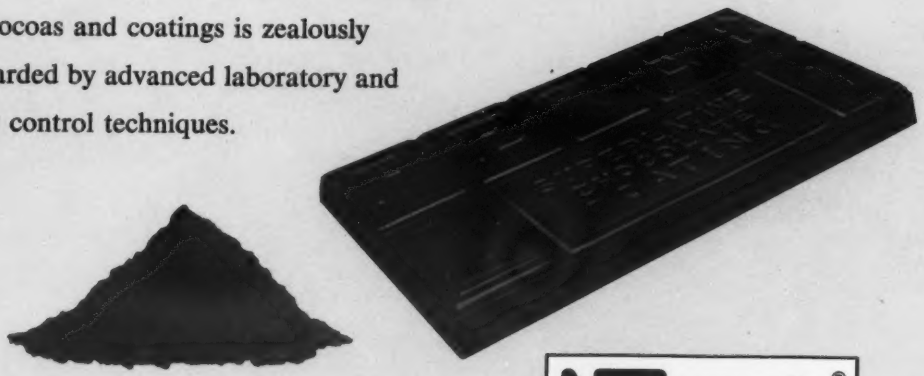

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# Food and Fallout

weeks following the blast.

The other isotope of current interest is iodine 131, which can affect the well-being of children, since it concentrates in the thyroid.

Because the same isotope is also used to treat certain thyroid disorders, current investigations are using this avenue for studying the hazards that iodine 131 from fallout are imposing.

The short-lived isotopes are mainly added to the food chain by deposition on the surfaces of food plants and feeds. The thorough washing received by processed foods greatly reduces this short-lived contamination.

Overhead irrigation, where available, could help dissipate this surface accumulation during the period immediately following contamination.

Immediate post-blast fallout tends to come down quickest during rainy periods within days or weeks after the explosion. This tendency accounts for some of the high regional readings reported after nuclear tests of 1958.

(Other localized "fallout hot spots" may also occur many months after a nuclear blast. Peculiarities of weather at times bring rains which remove a greater than average amount of fallout from the troposphere, and result in high readings for a period. This radioactivity is mainly from the longer-lived radioisotopes.)

If more nuclear testing gets underway, food processors should keep a careful eye on their producing areas. Particularly after rains, samples can be sent to radiological laboratories* for testing.

Once fallout enters the tissues of foods, there is little practical hope of removing it. Milk has been treated by ion exchange methods experimentally to remove strontium 89 and 90.

However, it will be several years before an acceptable commercial process can be expected, and then the expense will make it practical only on an emergency basis.

Such an emergency happened in England in 1958 after an accident in an atomic plant sprayed the surrounding pastures with irradiated debris. At that time, the contaminated milk from the area was dumped.

*Such as Tracerlab Inc., Waltham, Mass. and Richmond, Calif.

### Fallout and genetic damage

The threshold question is still wide open when applied to fallout as a cause for bone cancer and leukemia. There has been much discussion about the meaning of this word "threshold". If it is taken to mean that as we go to lower and lower radiation doses, the amount of damage produced goes down out of all proportion to the dose, probably most authorities would agree with this right now.

But if it is taken to mean that absolutely no effects occur below the threshold rather than that the number is vanishingly small, there is no full agreement.

For genetic damage, it has been widely agreed that no threshold exists. Geneticists contend that any amount of radiation, no matter how small, will cause some mutations. Other individual scientists say a threshold may exist, though it will be hard to ever prove or disprove.

### Positive steps

It is easy to see that many fallout questions remain unanswered, making a positive approach difficult. In the meantime, here's a five-point program which can be implemented now:

**1. Public policy.** Food processors can support programs which lower the total amount of radiation exposure in our population (consistent with their own philosophies about balancing radiation hazards against benefits.)

A suggested policy includes an insistence on a minimum of weapons testing consistent with national safety, as well as a minimum of x-rays for the safety of individuals. If more tests are necessary, only underground explosives should be allowed.

**2. Assessing news reports.** In assessing news reports on fallout, each report must be considered as only another part of the developing picture. It will probably be years before the picture is entirely clear.

Important issues may be overlooked or under-stressed in day-to-day news. Reports concerning threshould studies, for instance, are of far greater significance than headline reports on the current levels of strontium 90 in wheat, milk, and hay.

These latter will become significant only after considerable data have been gathered, collated, and scientifically analyzed.

On the other hand, all estimates of potential cancer and leukemia deaths from fallout radiation hinge on threshold question.

**3. Basic research.** The answers to most food fallout questions lie in *basic* research in biochemistry (including cancer and leukemia causes). Food industry advertising and research grants can promote such research.

**4. Atomic Wastes.** So far, no one knows the consequences to our seafood sources of deep-sea disposal of atomic wastes. Only low-level wastes have been disposed at sea so far.

The problem apparently is being handled competently, and is receiving careful study by marine biologists, but should be reviewed periodically by food technologists.

**5. Fear and risk.** Fear of the unknown is a dangerous force, and can cause far greater havoc than fallout itself.

Without belittling dangers of fallout, processors can put the danger in the same perspective as other commonly accepted hazards, such as a background radiation, x-rays, and auto accidents.

Such comparisons do not excuse fallout, but, now that we have to live with it, do show the relative place that fallout danger occupies on our scale of modern hazards.

Fallout in foods is an important subject for scientific investigation, but is no cause for hysteria. Fallout is receiving, while still in its crucial infancy, the competent attention from more scientists than any other similar hazards we face. END

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## Government to Spend $10 Million on Food Radiation Research

A $10,000,000 research program on the radiation processing of food has been announced by the Interdepartmental Committee on Radiation Preservation of Foods.

According to H. Herbert Hughes, Deputy Administrator of the Business and Defense Services Administration, US. Department of Commerce, who is chairman of the nine-agency committee, the following steps are being taken.

The Atomic Energy Commission has established a program of research and development on low dose radiation processing of perishable foods to extend shelf life. During the next five years the AEC expects to spend approximately $5,000,000 on this project.

Emphasis will be placed on basic studies in food chemistry, microbiology, wholesomeness testing, preservation factors of shelf life extension and radiation processing technology.

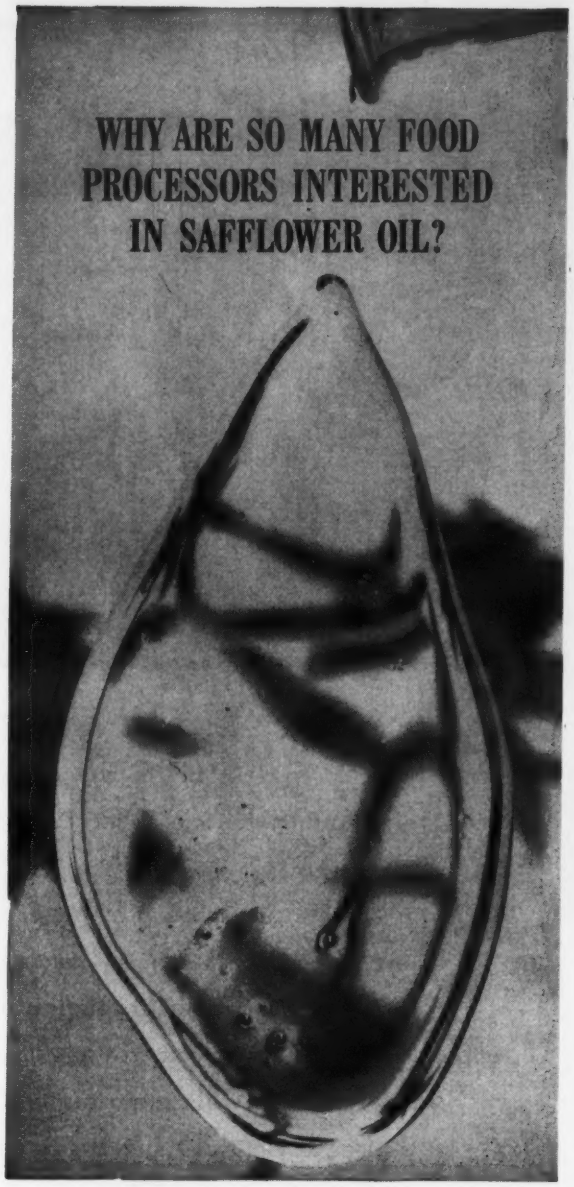
The Department of the Army has approved a revised Army food irradiation program. Over a six-year period, the Army Research program will cost an estimated $5,000,000.

Also proposed is construction of a radiation food research facility to cost about $1,800,000. This program will emphasize high dose treatment of foods.

Programs already under way by the Departments of Agriculture, Interior and Commerce will continue in cooperation with the Army and the AEC.

Research on the use of radiation for processing food will take into account the provisions of food regulatory acts, such as those administered by HEW and USDA. The wholesomeness and safety of radiation-processed food must therefore be established to the satisfaction of these agencies.

Mr. Hughes has indicated that as the national research and development program on radiation processing of food progresses, the Interdepart-


Food processors are turning more and more to the use of Safflower oil. For good reason: Research relates Safflower oil to the reduction of cholesterol in the blood. Safflower oil is between 88% and 91% unsaturated*. It contains between 74% and 79% linoleic acid—*contains more essential fatty acids than any other available vegetable oil or shortening**.

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# 9-10

*THESE* NUMBERS are especially important to you if you are attending the San Francisco INSTITUTE OF FOOD TECHNOLOGISTS' CONVENTION May 15th to 19th. They are important because they indicate the location of our Booths where the representatives and technical specialists of our firm can be seen and interrogated on any specific problem relating to the flavoring of your goods. Make note NOW that you — or any of your firm's attending representatives — will have this opportunity for a person-to-person exchange of ideas at Booths 9 and 10, and again, if you'll join us for hospitality, at our Presidential Suite headquarters (17th Floor) in the Mark Hopkins Hotel.

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mental Committee through its member agencies will encourage commercial adoption of this technology.

Agencies represented on the committee are these: Departments of State, Interior, Agriculture, Commerce, HEW, Army, AEC, Small Business Administration, and International Cooperation Administration.

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How you can improve supervisory performance on the job is outlined in 12-page brochure. Brochure contains actual samples of 52 aids which are sent on a planned yearly program to help develop supervisory leadership.

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Six motivation studies are also sent as part of the program to develop effective leadership. These studies serve to guide the supervisors' understanding and practical use of motivation techniques.

Actual case histories of supervisory experience are also part of the yearly program in the form of six career profiles.

As an aid in planning his work, a data book containing weekly planner pages, are sent to the supervisor throughout the year (one every other month).

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(Brochure on developing supervisory leadership, "Guidance That Pays," is available from Elliott Service Co., Inc., 30 N. MacQuesten Parkway, Mount Vernon, N. Y.)
7164 on Reader Service Slip.

**Check page 145 for helpful technical literature**

### Soft drinks . . . their composition & production

Comprehensive treatise covers all raw materials of carbonated soft drinks and describes their manufacturing steps in detail.

Methods of analysis, both for control during manufacturing and for determinations of composition of finished products, are listed.

Flow sheets of manufacturing procedures and diagrams of equipment are presented.

There is a chapter on types of spoilage and suggestions on their prevention, and a chapter on plant layout and sanitation.

("Carbonated Beverages—manufacture and analysis, 333 pp, may be purchased for $11.00 from The Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N.Y.)

### Successfully automating production

Book is written to help management and production personnel evaluate risks that will be encountered in successful automation with mechanical machines.

It explains how management team can solve problems and avoid pitfalls associated with automating production.

Text also offers practical pointers on contracting for automation projects at minimum financial risk.

First three chapters of book sketch industrial background and discuss analysis of operations for automatability. Other 11 chapters cover development of specific projects from conception through modeling, engineering and building all the way to "debugging" and run-in period.

Technical chapters are sufficiently deep to bring forth the thinking that must be gone through by team that will bring a machine into fruitful existence. They are well illustrated with drawings and examples.

("Automating The Manufacturing Process," 147 pp, may be purchased for $4.95 from Reinhold Publishing Corp., 430 Park Ave., New York 22, New York.)

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Now Fried Food Processing Enters a New Era

# FRY-O-MATIC

The Entirely New Continuous Fryer

New concepts in design and control provide you with quality and production levels never before possible! Combining the results of long experience in industrial frying with new basic design and modern engineering, the new Fry-O-Matic is being hailed as the finest fryer made today. The vice-president of one leading firm says, "We have never installed a machine in our plant with which we were so satisfied."

Any food which can be fried in oil can be processed by the Fry-O-Matic, and the advantages to anyone interested in improved uniform quality and money-saving production are worth investing!

- **Fry-O-Matic requires no direct labor from point of feed to discharge.**
- **As much as ⅓ less cooking oil is needed.**
- **The product is absolutely uniform—hour after hour.**
- **Heat control is as flexible as you want it.**
- **Change over from one type of product to another can be made in minutes.**

This list covers only a few highlights in the long list of reasons why the Fry-O-Matic continuous fryer has been such a success from the very start. Send today for full details about this latest addition to the Burns superior line of food processing machinery.

JABEZ BURNS AND SONS, INC.
ENGINEERS
NEW YORK CHICAGO
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### More reliable test for spoilage of frozen corn-on-the-cob

Cornell University food scientist, Dr. A. C. Wagenknecht, station biochemist at the New York State Agricultural Experiment Station, Geneva, N.Y., has developed what appears to be a more reliable test for possible spoilage of frozen corn-on-the-cob than is now employed in the frozen food industry.

#### Test for lipoxidase

Dr. Wagenkencht has shown that testing the frozen product for traces of lipoxidase, an enzyme occuring naturally in sweet corn, appears to be a more reliable index to possible spoilage than the conventional catalase and peroxidase tests.

In the tests, commercial packs of Victory Golden and Golden Cross sweet corn, frozen on the cob, were assayed for residual lipoxidase activity. They were then scored by a taste panel for flavor, following six months of storage at 0°F. The Victory Golden Corn showed residual lipoxidase activity and had developed off-flavors during frozen storage.

Dr. Wagenknecht comments that even though the corn had been blanched in flowing steam for 10 minutes to inactivate enzymes present in the fresh product, they were apparently underblanched as far as maintaining good quality in frozen storage.

#### Confirms testing

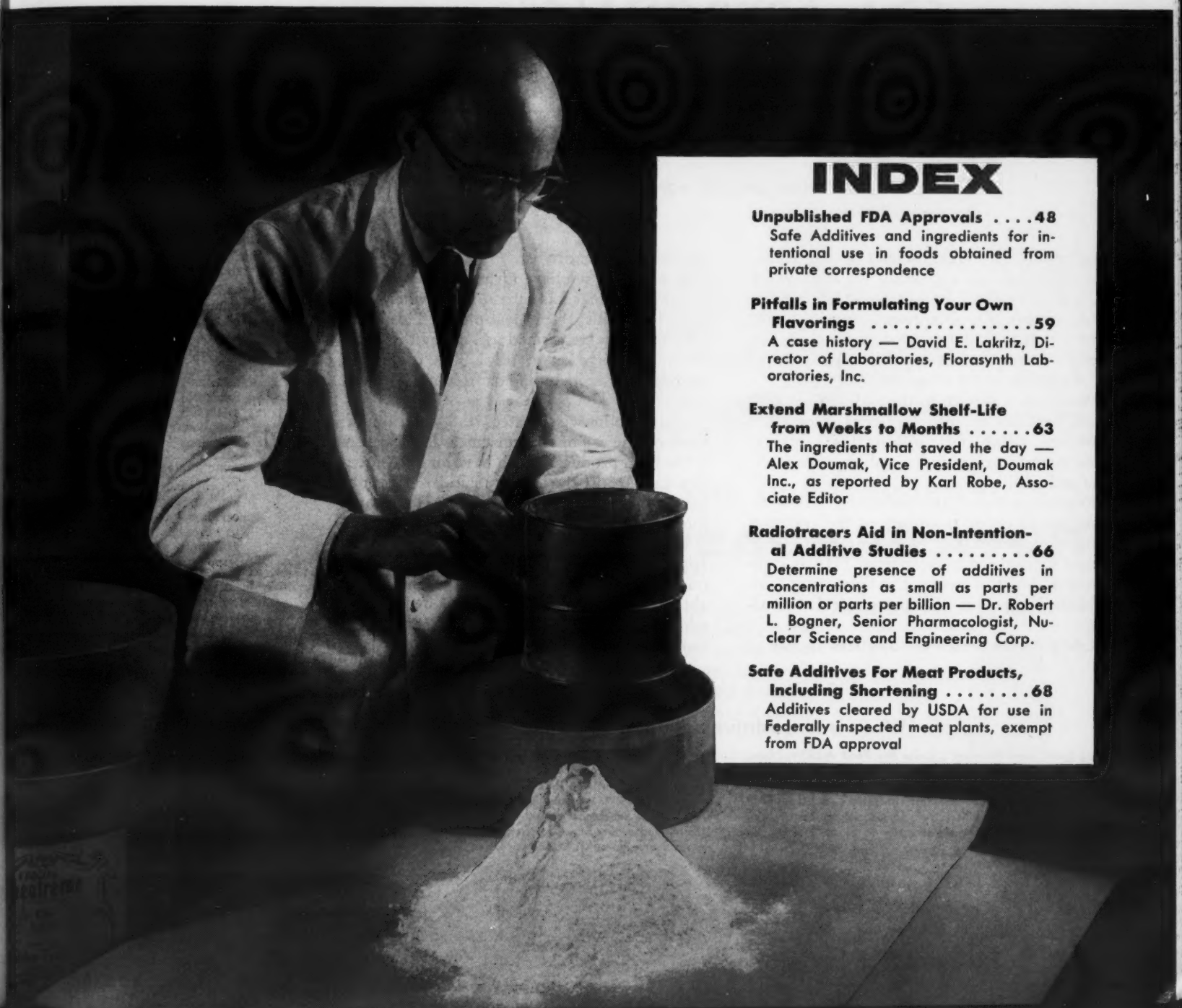
Similar results might have been inferred from positive tests for catalase and peroxidase, and confirmed by taste tests. However, corresponding samples of Golden Cross, which showed positive tests for catalase and peroxidase, were all scored "good" in the taste test.

Dr. Wagenkencht explains that the test for lipoxidase seems to be a better criterion for adequacy of blanching corn-on-the-cob because this enzyme causes the addition of oxygen to the unsaturated fatty acid in the fatty part of the corn. This action hastens the onset of rancidity.

*Spotlighting Regular Section on*

# INGREDIENTS

FOOD PROCESSING



## INDEX


**Unpublished FDA Approvals . . . . 48**
Safe Additives and ingredients for intentional use in foods obtained from private correspondence

**Pitfalls in Formulating Your Own Flavorings . . . . . 59**
A case history — David E. Lakritz, Director of Laboratories, Florasynth Laboratories, Inc.

**Extend Marshmallow Shelf-Life from Weeks to Months . . . . . 63**
The ingredients that saved the day — Alex Doumak, Vice President, Doumak Inc., as reported by Karl Robe, Associate Editor

**Radiotracers Aid in Non-Intentional Additive Studies . . . . . 66**
Determine presence of additives in concentrations as small as parts per million or parts per billion — Dr. Robert L. Bogner, Senior Pharmacologist, Nuclear Science and Engineering Corp.

**Safe Additives For Meat Products, Including Shortening . . . . . 68**
Additives cleared by USDA for use in Federally inspected meat plants, exempt from FDA approval

# "UNPUBLISHED FDA APPROVALS"

## For Additives and Ingredients Intentionally Used in Foods

### Obtained from private correspondence

Approval for a great number of ingredients and additives, not appearing on any "white list", is authorized by correspondence from FDA as safe for intentional use in foods. FDA's policy is to regard such approvals as private correspondence, publishable only at the discretion of the recipient.

Hence, as a service to the industry, FOOD PROCESSING requested a list of intentional additives, which fall within this category, from manufacturers and suppliers of ingredients and additives.

Replies received are published below in alphabetical order according to the common name of the substance. Following each alphabetical listing, a statement from FDA is summarized, which provides the heretofore "unpublished approval" for the particular product.

Complete addresses of suppliers appear at the end of the entire list.

In addition, we have included a list of substances recognized as safe by FDA when used in Federally inspected meat plants. This is the list of substances termed as safe by the Meat Inspection Division of the USDA for use in meat products, including shortening. This list will be found on page 68.

Unless otherwise stated, the only limitations on the use of the substances in these lists is for food products which have an FDA identity standard. If the identity standard does not provide for their use, additional approval must first be obtained from FDA.

It is intended that the list of "unpublished approvals" will be reprinted as a service to our readers. This reprint will become available at the end of June and will include any additions which may be made after the May issue went to press.

### When is an additive not an additive?

The term "food additive", under the Food Additives Law, has a peculiar legal definition.

If a substance added to a food is generally recognized as safe through either scientific procedure or experience based on common use, it is not considered an additive although it may be commonly referred to as an additive by the user.

Under the Food Additives Law, a substance is an additive only if it is not generally recognized as safe and requires testing to demonstrate its safety. (For a complete definition of an additive, the reader is referred to Section 201 of the Act.) Thus, substances given prior sanction by FDA or by USDA under the Meat Inspection Act (see list page 68) are not considered as additives.

**Autolyzed yeast extract (paste or powder)**

Autolyzed yeast extracts in paste and powder form, and with or without added salt, would . . . not be regarded as food additives, in that the water-soluble intracellular products of yeast are generally regarded as safe for food use by qualified experts. (Dated October 6, 1959)
**Supplier: Vico Products Company**

**Autolyzed yeast extract and salt, naturally smoked, concentrated**

. . . naturally smoked yeasts are not regarded as food additives under the Food Additives Amendment. [Therefore] in our opinion, "Naturally Smoked Concentrated Autolyzed Yeast Extract and Salt" is . . . not regarded as a food additive. (Letters dated June 6, 1958 and October 6, 1959)
**Supplier: Vico Products Company**

**Blusalt (salt, containing ultramarine blue)**

We have your letter of July 11 concerning the suitability of ultramarine blue as a coloring material for a salt product intended for animal feeding. On the basis of information available to us, we do not regard ultramarine blue as unsuitable for such use. (Dated July 21, 1949)
**Supplier: International Salt Company**

**Brominated vegetable oils**

. . . generally recognized as safe at a level of use not exceeding 200 ppm of the oil in a beverage. (Dated February 10, 1960)
**Supplier: Sterol Derivatives, Inc.**

**Calcium salt of methyl esters of p-Hydroxybenzoic acid**

Generally recognized as safe by appropriately qualified experts at a level of up to 0.1% in food. (Dated April 4, 1960)
**Supplier: Chemo Puro Manufacturing Corporation**

**Calcium salt of propyl esters of p-Hydroxybenzoic acid**

Generally recognized as safe by appropriately qualified experts at a level of up to 0.1% in food. (Dated April 4, 1960)
**Supplier: Chemo Puro Manufacturing Corporation**

**Calcium Stearate**

. . . no objection to use . . . in products such as you refer to, [dried onions and garlic products] if the quantity used is

limited to that necessary to prevent caking under appropriate labeling. (Dated October 15, 1948)

**Supplier: Basic Vegetable Products, Inc.**

**Carrot oil**

Requires no approval, except where addition of carotene or vegetable oils prohibited for other reasons than their safety.
**Supplier: Nutritional Research Associates**

**Casein-lactalbumin fusion**

The product, as outlined in your letters, is not considered to be a food additive. (Dated January 6, 1960)
**Supplier: Crest Foods Co., Inc.**

**Choline chloride**

It is our opinion that choline chloride [employed as supplement in poultry and swine feeds] . . . would be generally recognized by qualified experts as safe when used in accordance with good manufacturing practice. (Dated March 3, 1960)
**Supplier: Rohm & Haas Company**

**Diethylstilbestrol**

Safe for use as a feed additive: [for fattening beef cattle, no more than 10 mg per head per day; for fattening sheep, no more than 2 mg per head per day.] (Dated November 2, 1954)
**Supplier: Elanco Products Company, A Division of Eli Lilly and Company**

**Diglycerides and monoglycerides of palmitic and lactic acids**

No objection to use as an ingredient [food emulsifier, particularly for use in shortenings and cakes] under appropriate circumstances. (Approved for use in meat fat shortenings by the Meat Inspection Division of USDA — see MID, USDA list of approvals following this list of "unpublished approvals") (Dated December 27, 1957)
**Supplier: Atlas Powder Company**

**Enzyme preparations for use in feeds — non medicated livestock and poultry**

Such enzyme preparations, when derived from strains shown to be non-pathogenic for man and animals and prepared in accord with the manufacturing practices described in your detailed review, would be generally recognized by qualified

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**IMITATION PEACH FLAVOR**

This new member of Givaudan's flavor family exactly reproduces the mouth-watering goodness of rich, ripe peaches. All the delicate nuances of aroma and flavor are captured and concentrated for use in your ice creams, sherbets, candy, pie fillings and pharmaceutical products. Our peach flavor is also recommended as a modifying note for orange or cherry beverages, and is available in powdered or liquid form. To achieve the full natural flavor of fresh peach in your product, try Givaudan's Imitation Peach. Write for samples and full information.

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**No splash...**
**No spill...**
**No overfill!**

# Versatile Flocron dispenser ends costly ingredient loss for 63 different products!

Companies who pack, process or can everything from apple sauce and pickled beets to chicken soup and canned meats report substantial ingredient savings since using the new Flocron liquid dispenser. For the amazing Flocron avoids waste inherent in "overflow fill" systems, stops "splash loss" and dispenses more than forty different ingredients with speed and pin-point accuracy that saves money.

The versatile Flocron is actually a precise electronic system with photoelectric circuits in a sealed unit and a new lever-type photo switch to activate dispensing. It assures accuracy, even on lines handling up to 300 units per minute! Remote electronic controls permit you to "dial" the exact amount of liquid required for varying can sizes.

**Designed for efficient, low cost operation.** The Flocron is made of stainless steel and plastic and is constructed to avoid corrosion and lengthy breakdowns that result in costly downtime. There are no valves to stick or clog, and the Flocron is easily cleaned by circulating a detergent solution through the fluid system and following this operation with a sanitizer.

**No need to revise production lines.** The Flocron can be operated with existing equipment. Scientific Dispensing Company technicians are available in all areas to assist with installation and service problems.

**Some of the liquids you can dispense** with the Flocron include: ascorbic acid, beef gravy, brine, concentrated syrup, hot butter, Monosodium Glutamate, spice oils, sugar and brine, tomato puree and vinegar.

For a complete list of ingredients the Flocron dispenses and for additional information about the Flocron itself write:

**Scientific Dispensing Company**
**Division of**
**MORTON SALT COMPANY**
INDUSTRIAL DIVISION
Dept. FP 5,
*110 North Wacker Drive, Chicago 6, Illinois*

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experts as safe for use in animal feeds.
**Supplier: Miles Chemical Company**

**Enzymatic digest of casein**

Statement from FDA on file dated August, 1959.
**Supplier: Sheffield Chemical Company Incorporated**

**Enzyme preparations for use in foods: (1) Derived from the Aspergillus Flavus Oryzae group — carbohydrase and protease; (2) Derived from the Aspergillus Niger group — carbohydrase, cellulase, glucose oxidase-catalase, pectinase and lipase; (3) Derived from Bacillus Subtilis strains — carbohydrase and protease**

Generally recognized by qualified experts as safe for use in food when derived from strains shown to be non-pathogenic for men and animals and prepared in accord with good manufacturing practices.

These types of enzymes, covered by the FDA statement, include:

Pectinolytic Enzyme Products — To facilitate pressing of fruits and vegetables; for use in clarification of fruit juices and wine; to prevent gelation during concentration; and to prepare more uniform and more attractive jellies and marmalades. Also are used in the preparation of slow-set and low-methoxy pectin and in the firming of fruit and vegetables.

Proteolytic Enzyme Products — May be used in the manufacture of baked goods; as meat tenderizers; in chill-proofing beer; in preparing non-bitter protein hydrolysate for use in such applications as improving the nutritional value of certain cereal products; in modifying whey protein to be used as a base for cheese spreads; in stabilizing evaporated milk; imparting a cream-like flavor to milk; and in improving the wettability of dried milk.

Diastase Enzyme Products — May be used in producing sweet syrups of various types in baked goods; in producing fermentable sugars from starch or grains; in reducing the viscosity of chocolate syrups; in decreasing the viscosity of cereal mashes prior to drum drying for the production of powdered-precooked cereals; in recovering sugar from candy scrap; and in bringing about the liquefaction step in processes designed for the saccharification of starch and

starchy grains.

Lipolytic Enzyme Products — Are used in producing desirable characteristic flavors in such products as cheese, milk and chocolate.

Cellulolytic Enzyme Products — To reduce the viscosity of hydrated cellulose suspensions such as those produced by carboxymethylcellulose.

FDA statement covers enzyme products offered by the following suppliers:
**Fermco Laboratories, Inc.** (FDA statement dated February 8, 1960)
**Miles Chemical Company**
**Rohm & Haas Company** (FDA statement dated Feb. 3, 1960)
**Wallerstein Company** (FDA statement dated Feb. 9, 1960)

**Glucono-delta-lactone**

With good manufacturing practice from food grade materials, glucono-delta-lactone (for use as a leavening agent) is generally recognized as safe by qualified experts. (Letters dated February 17 and 25, 1960)
**Supplier: Chas. Pfizer & Co.**

**Glycerine, synthetic**

Synthetic glycerine is suitable for use in foods and drugs to the same extent as is purified glycerine from natural sources. Such material, in our opinion, would be generally recognized by appropriately qualified experts as safe. (Dated May 13, 1953)
**Supplier: Shell Chemical Company**

**Hydrolyzed vegetable protein**

(See: Protein, hydrolyzed vegetable)

**Hygromycin B**

Safe as use for feed additive [for control of infestation of large roundworms (Ascaris), nodular worms (Oesophagostomum) and whipworms (Trichuris). Level — 6 mg per pound, complete ration.] (Dated October 24, 1959)
**Supplier: Elanco Products Company**
**A Division of Eli Lilly and Company**

**Isolated proteins**

(See: Proteins, isolated)

**Lactalbumin**

The product, as outlined in your letter, is not considered to be a food additive.
**Supplier: Crest Foods Co., Inc.**

**Methyl esters of p-Hydroxybenzoic Acid**

Generally recognized as safe by appropriately qualified experts at a level of up to 0.1% in food. (Dated April 4, 1960)
**Supplier: Chemo Puro Manufacturing Corporation**

**Modified non-fat milk solids**

(See: Non-Fat milk solids, modified)

**Natural butter derivatives and butter esters**

(Used as natural butter flavor for bakery foods, confections, popcorn and specialty foods, including bakery premixes)
. . . would not be a food additive subject to clearance pursuant to provisions of the Food Additives Amendment provided that none of the saponifying or neutralizing agents or of the solvents used to extract the desired components from butter remain in the food. If they do remain, then their safety for such use would, of course, have to be considered pursuant to the provisions of the Amendment. (Dated May 20, 1959)
**Supplier: Sterol Derivatives, Inc.**

**Naturally hickory smoked concentrated autolyzed yeast extract and salt**

(See: Autolyzed yeast extract and salt, naturally smoked, concentrated)

**Non-fat milk solids, modified**

The products, as outlined in your letter [for use as a water binding agent, a stabilizer or a nutrient] is not considered to be a food additive. (Dated January 6, 1960)
**Supplier: Crest Foods Co., Inc.**

**Peptone**

Peptone [for increasing the soluble protein content of beer] made by good manufacturing processes, would, in our opinion, be generally regarded as safe and therefore not a food additive. This of course assumes that the pepsin meets standards set out in the USP and the soya bean protein grits are prepared from edible grade beans. (Dated March 15, 1960)
**Supplier: J. H. DeLamar & Son, Inc.**

**Propyl esters of p-Hydroxybenzoic Acid**

Generally recognized as safe by appropriately qualified experts at a level of up to 0.1% in food. (Dated April 4, 1960)
**Supplier: Chemo Puro Manufacturing Corporation**

**Protein, hydrolyzed vegetable**

. . . hydrolyzed vegetable protein is a substance that ap-


taste maker

FOR LIPTON SOUPS...

BAKON®

HICKORY-SMOKED YEAST...

Soup sippers are a fussy sort; they want both the rich green pea taste and an exciting blend of seasoning. Lipton finds that hickory-smoked BAKON YEAST helps provide a zestful bacon-like flavor and nutrition as well.

Food technologists appreciate the fact that BAKON is a U.S.P. Dried Torula Yeast, salt-free, and a carrier of 50% protein, the entire vitamin B complex, and the amino acids. Genuinely smoked BAKON is stable, uniform and contains no starch, sugar, or meat.

Discover for yourself why so many important food firms now incorporate hickory-smoked BAKON YEAST into their products for extra flavor and sales-appeal. BAKON is now used to flavor baby foods, nibbling foods, stews and vegetables, baked goods, sea foods, cheeses, spice mixes, and seasoning blends.

Lake States

*Manufactured and distributed for Bakon Yeast, Inc. by*

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Lake States Yeast and Chemical Division
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propriately qualified experts generally would regard as safe. We do not consider them to be food additives and believe that they are in the same category as . . . monosodium glutamate. (Dated May 29, 1959)
**Supplier: Hercules Powder Company, Inc.**

**Proteins, isolated**

Letter in file stating that they are generally recognized as safe.
**Supplier: Central Soya Company, Inc.**

**Smoked brewer's yeast (or smoked torula yeast)**

(See: Torula yeast, smoked)

**Smoked, dried torula yeast**

(See: Torula yeast, smoked, dried)

**Smoked torula yeast (or smoked brewer's yeast)**

(See: Torula yeast, smoked)

**Sodium alginate**

Considered safe food ingredient (stabilizer, thickener, emulsifying and creaming and gelling agent) and therefore may be used in non-standardized foods with proper label declaration. May also be used as optional ingredient in certain cheese products as authorized by standards for these foods. (Dated August 23, 1957)
**Supplier: Croda Inc.**

**Sodium carboxymethylcellulose**

We have your letter of February 10 with enclosures dealing with the pharmacological studies which have been conducted on sodium carboxymethylcellulose proposed for use as a stabilizer for ice cream. On the basis of the data submitted, this Administration will not interpose objections to the use of small quantities of this substance in ice cream. (Dated March 4, 1947)
With respect to cellulose gum [sodium carboxymethylcellulose] we contemplate that a forthcoming "white list" will include this item although currently it is our view that the minimum viscosity should be set at 25 centipoises rather than the 10 as set forth in your letter. Under the circumstances, we do not consider . . . [this] to be [a] food additive. (Dated December 11, 1959)
**Supplier: Hercules Powder Company, Inc.**

**Sodium erythorbate (sodium isoascorbate)**

With good manufacturing practice from food grade materials,

Members of the Food and Beverage Technical Service "team" shown here (l. to r.) are: Charles Feldberg, Dr. Rouben Kachikian, Joan Griffin, Everett Macdonough—Manager, John Geminder, Edward O'Neill.

1 2 3 4

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Sodium Citrate, Sorbistat®-K (Potassium Sorbate), Calcium Cyclamate, Sodium Benzoate, Citric Acid, Tartaric Acid, Caffeine, Ascorbic Acid, Erythorbic Acid, (Isoascorbic Acid)

MEAT PACKING
Erythorbic Acid (Isoascorbic Acid), Sodium Erythorbate (Sodium Isoascorbate), Ascorbic Acid, Sodium Ascorbate, Citric Acid, Biostat®-PA (Oxytetracycline), Sodium Citrate

MILLING & BAKING
Bi-Cap® (flour enrichment mixtures) L-Lysine, Glucono-Delta-Lactone, Tartaric Acid, Cream of Tartar, Citric Acid, Sorbistat® (Sorbic Acid), Sorbistat®-K (Potassium Sorbate), Sodium Benzoate, B Vitamins, Sol-U-Pak* *T.M.

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HIGHEST QUALITY
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"Quality" and "Pfizer Products" have been synonymous for over 110 years. This reputation results, in no small way, from the contributions of Pfizer Technical Service. This "helping hand" to our customers is available at every stage of product development. It is working proof of the Pfizer belief that a chemical manufacturer's responsibility extends beyond the point of making a sale.

For instance, baked goods manufacturers wanted a more controlled type of leavening action for the new "convenience" foods such as cake, general purpose, and specialty mixes. Pfizer developed Glucono-Delta-Lactone, a chemical leavening acid that imparts no unpleasant aftertaste, yet gives products excellent volume and fine even texture. In addition, G-D-L's low level of activity in storage insures longer shelf life.

When mold and yeast growth caused food freshness problems in cheese, wines, prepared salads, baked goods, etc., Pfizer Sorbistat®-K and Sorbistat® provided the means for ensuring that these products truly "stay fresher longer."

In the nutritional area, Pfizer L-Lysine has made possible great strides in improving the protein quality of foods ranging from breads to breakfast cereals...without affecting the taste or texture of the product. This essential amino acid "activates" the protein present, thus improving the total protein quality.

These are a few examples of how any Pfizer customer may benefit from our program of product assistance.

Pfizer

Why not put the Pfizer team to work for you?

5 **FROZEN FOOD**
Citric Acid, Ascorbic Acid, A-C-M®

6 **DAIRY**
Citric Acid, Sodium Citrate, Vitamin A, Sorbistat® (Sorbic Acid), Sorbistat®-K (Potassium Sorbate), Vitamin A Palmilets* Types M & W
*T.M.

7 **OIL AND FAT PRODUCTS**
Vitamin A & D, Beta Carotene, Citric Acid, Sodium Benzoate

8 **DESSERT**
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9 **CANDY**
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Quality Ingredients for the Food Industry for Over a Century




sodium erythorbate (for use as an antioxidant) is generally recognized as safe by qualified experts. (Letters dated February 17 and 25, 1960)
**Supplier: Chas. Pfizer & Co., Inc.**

**Sodium salt of methyl esters of p-Hydroxybenzoic acid**

Generally recognized as safe by approximately qualified experts at a level of up to 0.1% in food. (Dated April 4, 1960)
**Supplier: Chemo Puro Manufacturing Corporation**

**Sodium salt of propyl esters of p-Hydroxybenzoic Acid**

Generally recognized as safe by approximately qualified experts at a level of up to 0.1% in food. (Dated April 4, 1960)
**Supplier: Chemo Puro Manufacturing Corporation**

**Sodium silico-aluminate and sodium calcium silico-aluminate**

...on the basis of the pharmacological data which you furnished us in 1955, we are satisfied that these products are safe for use as anticaking agents when used within the stated maximum levels for the following foods: Salt, 2%; seasonings, 2%; baking powder, 5%; brown sugar, 1%; powdered molasses, 1%; and powdered sugar 1%. When used under the above conditions, these substances will not be subject to the Food Additives Amendment. (Letters dated March 20, 1956 and October 22, 1958)

Additional comment from supplier:
"In the Federal Register, February 2, 1960, FDA published a proposed list of substances generally recognized as safe. Under Anticaking Agents section of the proposed list, they showed the two chemical groups of Zeolex [trade name for sodium calcium silico-aluminate and sodium silico-aluminate] but identified as aluminosilicates. We have petitioned FDA to revert to the original chemical identities to avoid unwarranted label changes by our customers. The proposed list applied limits of 2%, but made no conditions (did not specific foods, as previously had been done.) The list has not been republished yet as a ruling."
**Supplier: J. M. Huber Corporation**

**Soy flour products**

Letter in file stating that they are generally recognized as

# Here's how Tora Food® can give you a new sales-building nutrition story at low cost

If you need a powerful new story to spark the sales of your cereal, Tora Food (Red St... brand name for Torula Yeast U.S.P.) is you... And you can actually *save* money. Here...

**How will Tora Food imp... tent of cereal?** Here are ... factors housewives know ... chart shows you how R... these factors in a typ...

| PER 100 G... | |
|---|---|
| Protein... | |
| Vitamin... | |
| Vitam... | |
| Nia... | |

| | |
|---|---|
| Vitamin $B_1$... | |
| Vitamin $B_2$... | |
| Niacin... | |
| Vitamin $B_6$... | |
| Para-amino benzoic Acid... | 20.4 |
| Pantothenic Acid... | 150.0 milli... |
| Folic Acid... | 95.3 milligra... |
| Choline... | 4.8 grams worth |
| Inositol... | 5.4 grams worth |
| High quality Protein... | 1.5 lbs. |

Here is a nutritional "barrage" that can't help but impress the nutrition-conscious housewife.

**How can Tora Food actually save you money?** The ingredients listed above would cost you 87.33¢ at current price levels, if you bought them individually. You get these *same* ingredients in the *same* amounts for only 54¢ in Red Star Tora Food. That's 33.33¢ saved. (Incidentally, the same amount of brewer's yeast would cost you between 72¢ and 84¢.)

In addition, Tora Food saves you money on ... and inventories. Instead of buying, stor... and keeping books on 10 or more ...ients, you need handle only *one* ...tar Tora Food.

**...improve saleability**

...sify the flavor of ...vor with the ...product

**...tora**

...we've ...ut baby ...Star Tora ...other types ...o big advan... ...butter, sauce ...ked yeast and

...*any* food processor) ...ting nutrition story, ...y to show and discuss ...is that has been done. Or ...ppy to have a nutritionist ...he address below.

*Let Tora Food® help you make money— low cost with these plus factors for your product:*

- ANTIOXIDANT EFFECT—INCREASES SHELF LIFE
- FLAVOR BOOSTING EFFECT
- HIGH QUALITY PROTEIN
- 50% EXCELLENT SOURCE OF B COMPLEX VITAMINS
- LOW SODIUM CONTENT—VIRTUALLY SALT FREE
- COMPATIBLE WITH ALMOST ANY PROCESSED FOOD

Our technical staff will be pleased to discuss Tora Food with you and your staff. Write or call collect for conference appointment or detailed information. There is no obligation.

*Nutritional Division*

# RED STAR YEAST & PRODUCTS CO.

Milwaukee 1, Wisconsin

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safe.
**Supplier: Central Soya Company, Inc.**

**Staybelite Ester 5**

A check of the status of staybelite ester 5 [used as a chewing gum resin] leads to the conclusion that you have a prior sanction for this item and the additional work which you submitted with Dr. Frawley's letter of May 11, 1959, confirms that the original sanction was a proper one. Under the circumstances, we do not consider . . . [this] to be [a] food additive. (Letters dated December 11 and 29, 1959)
**Supplier: Hercules Powder Company, Inc.**

**Tannic Acid N. F.**

Generally recognized as safe for use in beer where residual amount does not exceed 100 parts per million. (Dated March 14, 1960)
**Supplier: Mallinckrodt Chemical Works**

**Torula yeast, smoked (or brewer's yeast smoked)**

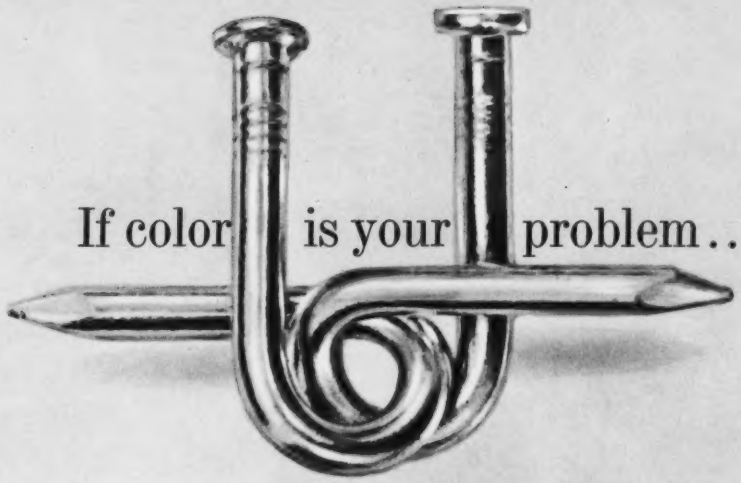
Naturally smoked yeasts are not regarded as food additives under the Food Additives Amendment to the Federal Food, Drug, and Cosmetic Act. (Dated August 11, 1959)
**Supplier: Vico Products Company**

**Torula Yeast, smoked, dried**

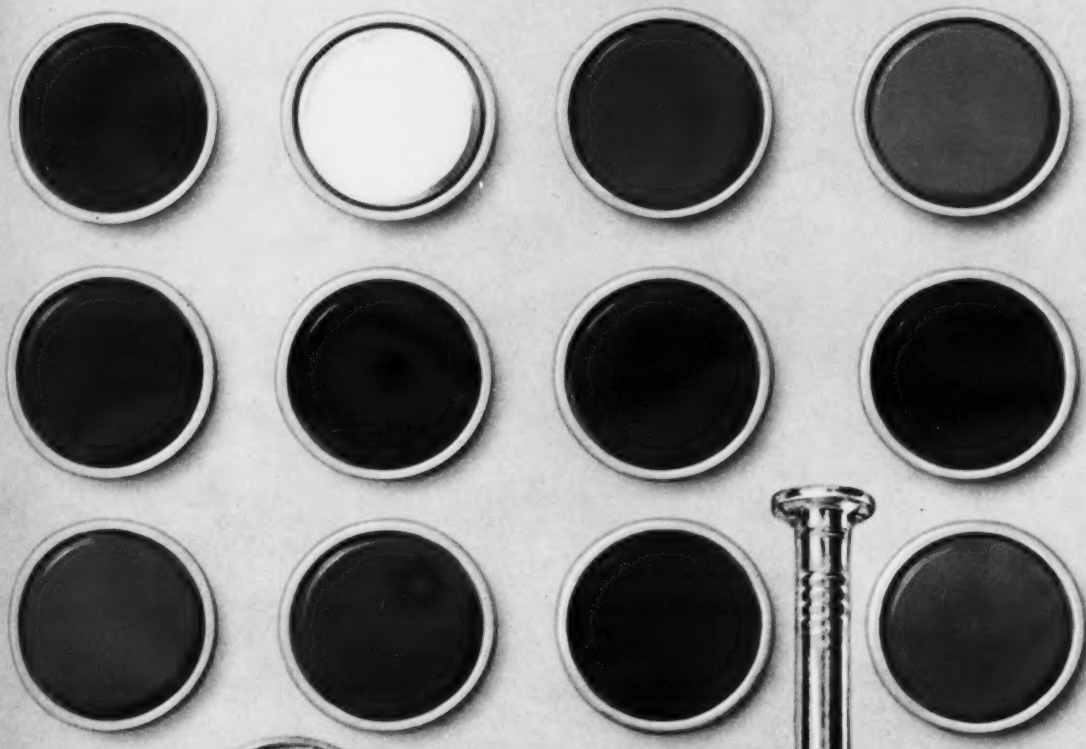
Based on the data that you have furnished, we are of the opinion that a smoked dried Torula yeast, prepared under the procedure you describe, would be a substance that appropriately qualified experts generally would regard as safe for food use and, under the circumstances, would not be subject to the clearance provisions of the Food Additives Amendment. (Dated June 3, 1959)
**Supplier: Lake States Yeast & Chemical Division St. Regis Paper Company**

Address of suppliers of ingredients and additives in this list will be found on page 56.

For more information on product at right, circle 7171 . . . see information request blank opposite last page.



If color is your problem...



Kohnstamm is the answer

H. KOHNSTAMM & CO., INC.

SINCE 1851

First producers of certified colors. 161 Ave. of the Americas, New York 13; 11-13 E. Illinois St., Chicago 11; 2632 E. 54 St., Huntington Park, Calif. In Canada: Stuart Bros. Ltd., Montreal, Toronto, Winnipeg & Vancouver.

### Buyers' Guide to "Unpublished Approvals"

Complete names and addresses of manufacturers and suppliers whose ingredients or additives appear in the list of unpublished approvals are given in alphabetical order below:

**Atlas Powder Company**
**Wilmington 99, Delaware**

**Basic Vegetable Products, Inc.**
**Vacaville, California**

**Central Soya Company, Inc.**
**1825 N. Laramie Ave.**
**Chicago 39, Illinois**

**Chemo Puro Manufacturing Corporation**
**150 Doremus Ave.**
**Newark 5, New Jersey**

**Crest Foods Co., Inc.**
**Ashton, Illinois**

**Croda Inc.**
**15 East 26th St.**
**New York, New York**

**J. H. DeLamar & Son, Inc.**
**4529 North Kedzie Ave.**
**Chicago 25, Illinois**

**Elanco Products Company**
**A Division of Eli Lilly and Company**
**740 South Alabama St.**
**Indianapolis 6, Indiana**

**Fermco Laboratories, Inc.**
**4941 South Racine Ave.**
**Chicago 9, Illinois**

**Hercules Powder Company, Inc.**
**Delaware Trust Building**
**900 Market St.**
**Wilmington, Delaware**

**J. M. Hubber Corporation**
**630 Third Ave.**
**New York 17, New York**

**International Salt Company**
**Watkins Glen, New York**

**Lake States Yeast & Chemical Division**
**St. Regis Paper Company**
**Rhinelander, Wisconsin**

**Mallinckrodt Chemical Works**
**Second and Mallinckrodt Sts.**
**St. Louis 7, Missouri**

**Miles Chemical Company**
**Division of Miles Laboratories, Inc.**
**Elkhart, Indiana**

**Nutritional Research Associates**
**South Whitely, Indiana**

**Chas. Pfizer & Co., Inc.**
**630 Flushing Avenue**
**Brooklyn 6, New York**

**Rohm & Haas Company**
**Washington Square**
**Philadelphia 5, Pennsylvania**

**Sheffield Chemical**
**Norwich, New York**

**Shell Chemical Company**
**110 West 51st Street**
**New York 20, New York**

**Sterol Derivatives, Inc.**
**3626 Medford St.**
**Los Angeles 63, California**

**Vico Products Company**
**415 West Scott St.**
**Chicago 10, Illinois**

**Wallerstein Company**
**Division of Baxter Laboratories, Inc.**
**Wallerstein Square, Mariners Harbor**
**Staten Island 3, New York**

### Extension date for 31 direct additives

FDA stayed effective date of Additives Law to March 6, 1961 for the following direct additives when used in foods under the conditions specified. Included are chewing gum and protective coating materials as well as substances of a general nature.

Aluminum stearate — 25 ppm as a constituent of chewing gum base

Butyl rubber (chewing gum grade) without inhibitor— as a constituent of chewing gum

Calcium disodium-ethylene diamine tetraacetic acid dihydrate — 25 ppm as a sequestrant in malt beverages

Calcium disodium-ethylene-diamine tetraacetic acid dihydrate — 75 ppm as a sequestrant in canned pineapple chunks (nonstandardized article)

Calcium steraryl-2-lactylate — 0.5% in egg white solids

Calcium steraryl-2-lactylate — 0.05% in liquid and frozen egg whites

Calcium steraryl-2-lactylate — 0.35% in nonstandardized bakery products

p-Coumarone - as a constituent of chewing gum base

Coumarone-indene resin — as a constituent of chewing gum base

Disodium dihydrogen-ethylenadiamine tetraacetic acid — 75 ppm as a sequestrant in canned pineapple chunks (nonstandardized article)

Estergums (rosin or hydrogenated rosin reacted with glycerin or pentaerythritol and polymers) — as a constituent of chewing gum base

Fat (animal and vegetable), hydrolyzed (free of toxic impurities) — 12.5% in feed for livestock and poultry

Gums (natural) of vegetable origin — as a constituent of chewing gum base

Hydrogen cyanide — 25 ppm as a residue from the use of hydrogen cyanide as a fumigant

Isobutylene-isoprene — as a constituent of chewing gum base

Isobutylene resin — as a constituent of chewing gum base

Lanolin — as a constituent of chewing gum base

Latex (butadiene styrene rubber) — as a constituent of chewing gum base

Methyl ester of rosin (hydrogenated) — as a constituent of chewing gum base

Mineral oil — 3.3 ppm as a constituent of defoaming agent used in manufacture of beet sugar

Mineral oil (including petrolatum) — 600 ppm in total ration as a lubricant or dust-control agent in bulk animal feed and pelletized animal feed, including salt blocks for animal use

Mineral oil (including petrolatum) — 35 ppm on fresh fruits and vegetables as a protective coating

Petroleum hydrocarbon resin — as a constituent of chewing gum base

Polyethylene — as a constituent of chewing gum base

Polyethylene glycol 400 monooleate — 10% of fat content to emulsify the fat and as defoaming agent in calf-feed milk replacer

Polysorbate 80 — as solubilizer in essential oils

Rubber (natural), smoked sheet, and latex solids — as a constituent of chewing gum base

Sodium lauryl sulfate — 125 ppm as a stabilizer in liquid and frozen egg whites

Sodium lauryl sulfate — 1000 ppm as a stabilizer in egg white solids

Sodium nitrite — 10 ppm in

cured tuna fish

Sodium nitrite — 20 ppm in canned pet animal food containing fish and/or meat

Sodium dodecylbenzene sulfonate — 2 ppm in fruits and vegetables as residue from its use as a detergent di-Starch phosphate (amylopectin reacted with sodium trimetaphosphate) — 5% as a modified starch in food.

Terpene resin — as a constitent of chewing gum base

Trichloroethylene — 10 ppm as a residual solvent in manufacture of decaffeinated coffee

Ultramarine blue — 0.50% in salt for animal feeds (see unpublished approvals listing page 48.

Wax, microcrystalline, and paraffin — as a coating on fruits, vegetables, and cheese. As a masticatory substance in chewing gum
Two types wax:
Type I — A congealing point of 160 F, maximum (ASTM D-938), and absorptivity at 290 millimicrons of 0.04 liter per gram centimeter maximum (ASTM E-131), an oil content of 1.5% maximum (ASTM D-721), and a Saybolt color of 20 minimum (ASTM D-156)
Type II — Absorptivity at 290 millimicrons of 1.0 maximum, an oil content of 5.0% maximum, and a color of 3.0 maximum (ASTM D-1500)

### Studies odor and flavor problems

Odor, flavor and sensory panel studies, as an aid to improving your product, are subject of accordion fold-out brochure. Illustrated brochure explains what sensory panel studies are and gives examples of studies on flavor research, contamination, pilot consumer surveys and packaging.

Sensory panel, as a research tool, can detect, identify and measure very low levels of actual contamination and nearly always determine the cause and suggest a remedy for subtle off-notes in odor,

PUT YOUR PRODUCT IN ORBIT

with a FRIES & FRIES "SPACE AGE FLAVOR!"

Many new food products blast-off with a satisfactory roar, only to disappear later into the ocean of unsuccessful ventures. In spite of the millions in research, development, packaging, and market testing behind them, only a relative few have all the essentials, plus that extra "thrust of power", of an individually developed **flavor** that's built right into the basic formula. FRIES & FRIES "Space Age Flavors" are engineered for the current era . . . the era of convenience foods. They're made for your product by people who know the flavor business with a thoroughness that comes from generations of experience. Launching a new product is expensive and difficult. Let a FRIES & FRIES Space Age Flavor give it that thrust necessary to put it into a long, swinging, profitable orbit!

MANUFACTURING CHEMISTS
FRIES & FRIES INC CINCINNATI U.S.A.

CINCINNATI . . . 110 E. 70th Street
NEW YORK . . . 418 E. 91st Street

7172 on Reader Service Slip.



Are you using the right antioxidant?

Finished goods . . . not just original fats . . . need protection against rancidity!

Do you want crackers, pastry or potato chips to stay sweet and fresh over long periods of time? Then use Sústane BHA . . . or Sústane 6.

Developed by Universal, BHA not only prevents rancidity in fats, but surpasses all others in its resistance to the cooking process and carry-through into the finished product.

For more than 25 years UOP has specialized in the development and use of antioxidants. Our Food Service Group can furnish invaluable guidance in determining the most effective antioxidant to meet your specific requirements. Write for detailed information . . . no cost or obligation. Address our Products Department.

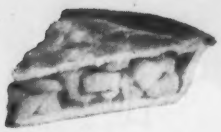
Sústane®

made in 4 forms, 7 formulations . . . keeps lard and shortening fresh.

UOP UNIVERSAL OIL PRODUCTS COMPANY
30 Algonquin Road, Des Plaines, Illinois, U.S.A.

WHERE RESEARCH TODAY MEANS PROGRESS TOMORROW

7173 on Reader Service Slip.



Morningstar-Paisley is the country's foremost supplier of potato starch and the major importer of food tapioca and arrowroot. Modern production facilities are used to process highest quality refined and pregelatinized food starches to meet all requirements.

REDISOL,* FRUITFIL,* TENDERFIL,* and FREEZIST® are Morningstar-Paisley food starches used by quality-conscious bakeries, canned food, frozen food and food specialty processors from coast to coast.

**You will profit by knowing them better.**

# starches

Morningstar-Paisley is the nation's leading source for food-quality water soluble gums—Gum Arabic, Gum Karaya, Gum Tragacanth, Locust Bean Gum, Guar Gum, Agar-Agar, and Okra Gum. We select, sort, grind, blend, and refine them into function-serving ingredients for the food and beverage industry.

The stabilizing, water holding and thickening properties of these natural gelling agents are depended upon by major food processors. Morningstar-Paisley can be depended upon to supply them.

**You will profit by knowing us better.**

# and gums

Ask about Morningstar-Paisley's complete line of food starches, flours and gums. Tell our Food Technologists about your special requirements for thickening, binding or emulsifying. Write direct to . . .

MORNINGSTAR-PAISLEY, INC., 630 W. 51st St., New York 19, N. Y.

*Reg. applied for*

# from MORNINGSTAR-PAISLEY

Offices in 28 principal cities from coast-to-coast. In Canada: Morningstar-Paisley of Canada, Ltd., Toronto

7174 on Reader Service Slip.




flavor, texture, etc.

Services provided by standard sensory panel techniques include product improvement, evaluation and development; prediction of consumer acceptability; flavor analysis, improvement and development; packaging materials and shelf life studies; quality control; and studies of contamination.

(Brochure on "Odor Flavor and Sensory Panel Studies" is available from Foster D. Snell, Inc., 28 and 29 W. 15th St., New York 11, N.Y.)
7175 on Reader Service Slip.

### Using edible whey

The use of edible whey in bakery foods, confectionery products, frozen desserts, meats, soups and other products is described and illustrated in 4-page brochure.

Advantages for use in each of these products is discussed as well as comparison of cost and quality with other similar products. Comparison of composition between edible whey and nonfat dry milk, according to lactose, lactalbumin, minerals, moisture, fat and casien is shown.

("Sweet Dairy Whey," 4-page brochure, is available from Western Condensing Company, Division of Foremost Dairies, Appleton, Wis.)
7176 on Reader Service Slip.

"This man's job is to verify every quart of sour milk returned by customers."

Quality control of flavors starts in actual production where samples are drawn and transferred to the laboratory for numerous tests to assure uniform quality in a given flavor or blend year after year

**Case history demonstrates the . . .**

# Pitfalls in formulating your own flavorings

**How many food processors maintain the necessary quality control to produce uniform flavorings in their own plants?**

**DAVID E. LAKRITZ**
Director of Laboratories
Florasynth Laboratories, Incorporated

Flavor laboratories, such as the one pictured, have extensive analytical facilities and quality control methods to test flavor samples for appearance, size, uniformity, color, etc. Here chemical tests are also conducted for ingredient composition as well as ingredient quality. Other facilities are available using expert tasters and taste panels to determine flavor preferences and differences.

THIS is the case history of the experience one food processor had in formulating flavorings in his own plant. Some incidents have been altered so as to make plant identity impossible. But the story is essentially documentary.

About 30 years ago, a group of men started a modest business in the food industry. Their combined talents gave them a generous supply of know-how in production and distribution.

Added to these skills was a fair share of money and imagination. A few food specialties were launched, but better made and better packaged than the usual run-of-the-mill products. More items were added to the line, a few mergers were brought about, and the company grew into a fairly large organization.

Within only ten years, a number of the company's products had achieved national distribution. To meet production schedules, the purchasing department was buying an almost endless number of raw materials. Included in these raw materials were about 15 flavors from a half dozen different suppliers.

Repeated purchase of these flavors led the company to believe that considerable economies could be realized by formulating flavors right in their own plant. Therefore, a flavor chemist and two assistants were employed, and a flavor laboratory was set up.

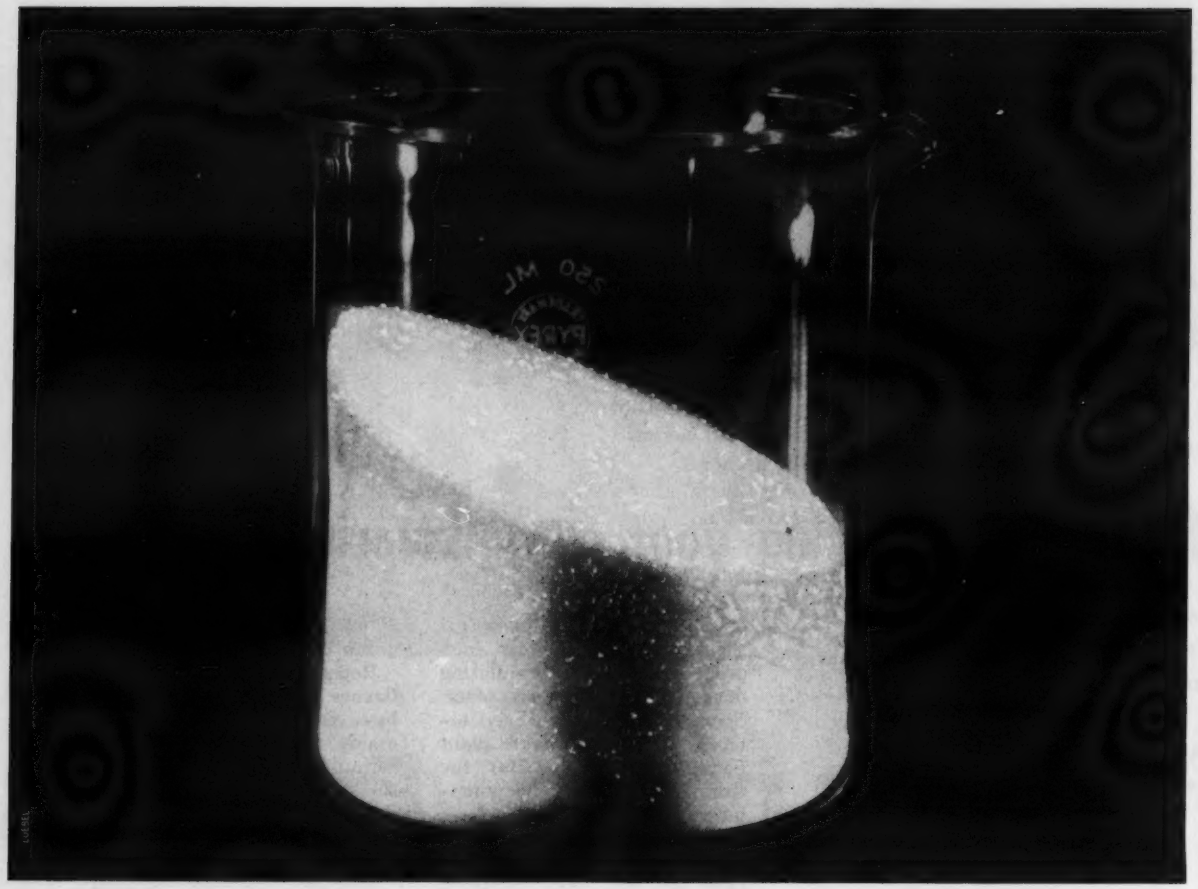
One by one the blended flavors, which had heretofore been purchased, were replaced with flavors made in the plant.

Although some of these flavors contained only a few ingredients, others had as many as 30 or 40. To formulate all of the flavors being used, it was necessary to carry an inventory of more than 200 separate materials, some employed in very small quantities.

The buying of these numerous raw materials consumed even more time in the purchasing department than had previously been required. And even then the flavor division continually found itself short on some particular ingredient at the very time it was needed.

There were other problems involved which also became sources of serious difficulty.

# SALT OF UNEQUALED QUALITY



■ An increasing number of canners, bakers, meat packers and other food processors now specify Sterling Purified Salt in all their operations. Always more than 99.9% pure sodium chloride (less than 30 ppm calcium and magnesium, less than 0.2 ppm trace metals), this remarkable product also offers the distinct advantages of a granulated salt. It is uniform in crystal size—won't "break up" in handling. It has a constant volume for any given weight—can be measured with precision. And Sterling Purified Salt dissolves instantly and completely in every salting operation—thus insuring uniform flavor, color and texture in food. We urge you to test Sterling Purified Salt and compare the results with the salt you are using. You can arrange a test by contacting International's local representative or the nearest district office: **Boston, Buffalo, Charlotte, Chicago, Cincinnati, Detroit, Newark, New Orleans, New York, Phila., Pittsburgh, St. Louis.** Or write direct to International Salt Company, Clarks Summit, Pa.

**INTERNATIONAL STERLING SALT SALT COMPANY**

"A STEP AHEAD IN SALT TECHNOLOGY"

7177 on Reader Service Slip.




Compounding flavors could be entrusted only to highly skilled workers, making labor costs formidable. And it was not possible to use these workers in other activities when they were idle.

The flavor division, by necessity, had been set up as a completely separate division to assure that flavors would be free of contamination from other ingredients. Production of an individual flavor required that tanks, other containers and utensils as well as mixing equipment be set aside for that one flavor only.

This entailed much duplication and little day-to-day use of costly units. The only alternative was to wash everything with steam, alcohol or other expensive methods, making the flavor division take on the appearance of a metal and glass laundry.

Furthermore, it was discovered that although the flavors were produced under efficient supervision, there was a definite lack of uniformity in the products. In the case of natural ingredients, such as essential oils, there were unavoidable variations at times which had to be compensated for.

Some of the less common materials were not always easy to obtain on short notice and substitutions had to be made. The limited time and experience of one flavor chemist and two assistants were simply not sufficient to cope with such unexpected difficulties.

Considering all of these problems, management came to the conclusion that what began as an economy measure, turned out to be an expensive and questionable luxury.

Therefore, they are now buying their flavors instead of trying to make them. But they are bought with great care and thought.

The chemist who was formerly in charge of producing them now devotes all of his time and effort in advising the purchasing department on just what to buy. The purchase of flavors has been consolidated in such a manner that they now come from a few reliable

(*Continued on page 62*)

***that's interesting***

**Leasing increasing**

Small businesses facing tight money problems are turning more and more to equipment leasing as an alternative to cash outlays for capital goods, Nationwide Leasing Co., Chicago, reports.

More than half of all equipment leases now being written are for firms with total assets of $5,000,000 or less, and the average length of lease for these companies is 3.7 years, Nationwide says.

"It's quite possible that in ten years, half of the production equipment being used by firms of this size will be leased," believes Nationwide.

**That's not chicken feed!**

In 1935 it took 16 to 17 weeks and five pounds of feed to produce a single pound of poultry meat. Today, a broiler can be produced in just nine weeks with 2½ pounds of feed per pound of meat.

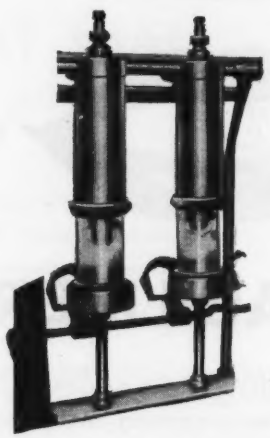
Still unsatisfied, the hatchery feed and broiler processing industries have set a 1967 goal of less than two pounds of feed and still less time.

*We Control Everything*

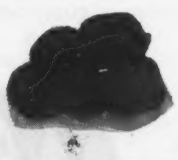
*(everything but nature)*

*To Bring You*

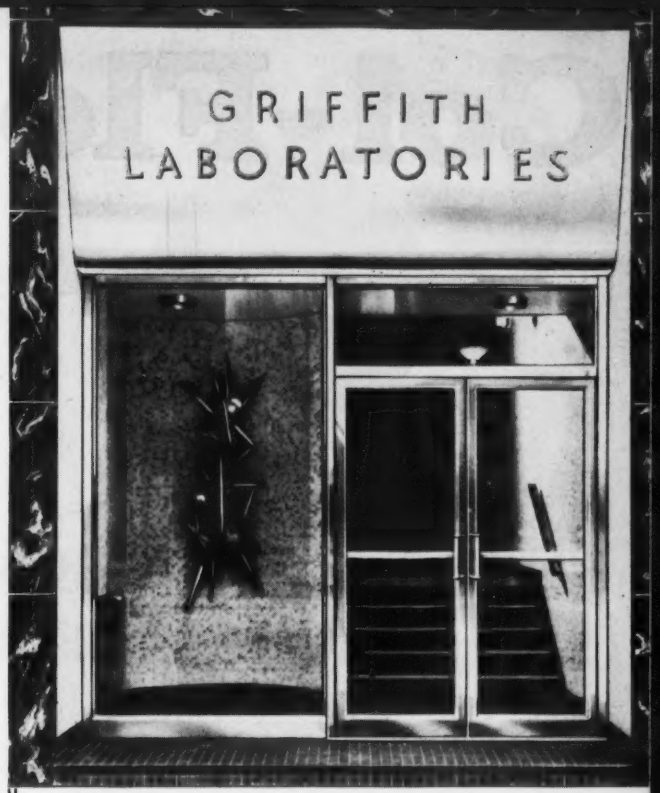
*The Best in Spices*



There's more to this story of quality control and how it gives you the best flavor in spices. The Griffith man will tell you about it next time he calls.



*The Best in Cures to go with the Best in Spice*




Our control starts with laboratory evaluation of a sample of the spice under consideration. It must *measure up* to Griffith's standard in both chemical and organoleptic evaluations.

When the shipment of spice arrives, we repeat the evaluation procedure to compare it with the sample.

In storage, the freshness and quality is protected by regulation of light, humidity and temperature.

And grinding is laboratory controlled. The meshes are checked. A "balance" is run—to be sure that spices are being ground to the desired meshes without loss of flavoring.

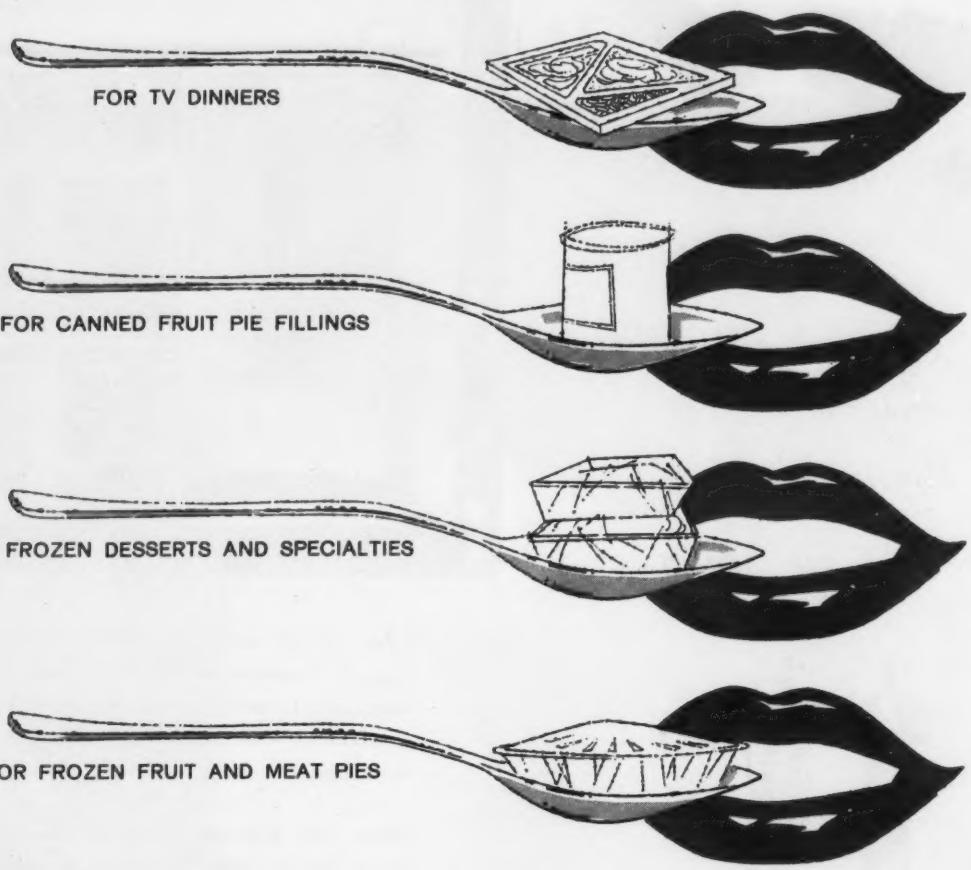
Last stage of control is packaging. According to the customer's wish: "Bulk," in fiber drums. Or, sealed in cellophane within a batch-size (unit) bag — packed in a fiber shipping drum.

**THE GRIFFITH LABORATORIES, INC.** •

CHICAGO 9, 1415 W. 37th St. • UNION, N. J., 855 Rahway Ave. • LOS ANGELES 58, 4900 Gifford Ave.

7178 on Reader Service Slip.

# Col-Flo 67




## NEW STANDARD IN STABILIZERS

COL-FLO 67—canned or frozen—never imparts an undertone of cereal taste. Never interferes with natural food flavors.

UNMATCHED STABILITY. Col-Flo 67 safeguards and improves stability. All tests show far greater resistance to freeze-thaw breakdown than wheat flour or other waxy starches.

EXCELLENT CLARITY. Col-Flo 67 doesn't cloud natural colors between processing and eating. An appealing crystal clear glossiness highlights your food product.

A simple taste comparison quickly emphasizes the advantages of tasteless Col-Flo 67. Write for details, telling us something of the use you have in mind.

National STARCHES

NATIONAL STARCH and CHEMICAL CORPORATION

750 Third Avenue, New York 17 • 3641 So. Washtenaw Avenue, Chicago 32 • 735 Battery Street, San Francisco 11

7179 on Reader Service Slip.




(*Continued from page 60*)

suppliers.

Whenever possible, the same flavor is used for more than one product. In this way, larger quantities are purchased at one time at a considerable saving in cost.

Because of a thorough investigation of the storage of flavors to determine which can be stored for long periods of time without any noticeable spoilage, certain flavors can how be purchased in substantial amounts, to be used as needed.

No longer must production be delayed because the flavor department has run "out of something or other." Effective planning makes it possible to order well in advance of immediate requirements so that flavors arrive in time to be on hand when wanted.

One may wonder if those who specialize in the making of flavors are not confronted with the same problems as the food processor cited in our case history. They are; but a flavor manufacturer's production is carried out on a large scale.

Ingredients are purchased in relatively large quantities. The staff consists of many members whose combined knowledge and experience are always available to solve the difficulties as they come up.

Because of research laboratories, analytical facilities and quality control methods that few, if any, food companies can possibly maintain, flavor manufacturers are in a position to supply quality and uniformity in a given flavor or blend year after year.

The research these manufacturers conduct on flavors is the combined undertaking of a group of investigators and their assistants. They employ elaborate apparatus and devote all of their training, time and experience to the development and production of the best possible flavor for a given product at a minimum cost.

It is doubtful that the food processor or beverage manufacturer could possibly produce flavors in his own plant at any saving if the cost of labor as well as the cost of raw materials is considered.

The greater water retention properties of waxy maize starch, W-13 (on right), as compared to corn starch (at left) are illustrated in adjoining photo. Each bottle contained two per cent starch concentration in water. The picture shows the greater swelling power of W-13 (right) after the solutions were held at 87 C for 30 minutes and then centrifuged

# 'The ingredient that saved the day'

**Changeover to marshmallow extrusion process nose-dived shelf life — until waxy maize extended it from weeks to months**

**ALEX DOUMAK,** Vice President
Doumak Inc.
as reported by **KARL ROBE**

**PROBLEM:** When Doumak Inc., Los Angeles marshmallow specialist, converted to their patented extrusion process several years ago, shortened shelf life resulted that "virtually put us out of business."

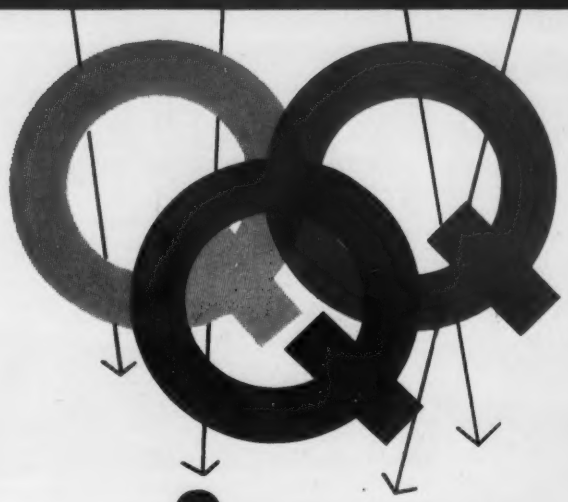
The new process had changed the moisture retention characteristics; something had to be done, and done fast.

**Solution:** A waxy maize starch, W-13, became available and was added to the formula at suggestion of the supplier. This starch is a hydrophilic colloid, which differs in several respects from former boiling starches.

It imparts no starch taste in the quantities used (below 5 per cent by weight of total formula), and mingles intimately with other ingredients, leaving no scratchy texture. It completely gelatinizes in formula.

In the sponge matrix of the marshmallow foam structure, the waxy maize

Newest Doumak product is chocolate marshmallow. Product uses waxy maize, gelatin, real chocolate and milk solids

# 3 ANSWERS TO IMPORTANT QUESTIONS YOU SHOULD ASK ABOUT I.L.S.*

## THE ONLY INSTANT LIQUID STABILIZER

**Q.** What is the big advantage of using a liquid stabilizer?

**A.** You get the fastest, easiest and most economical stabilization, never before possible. **ILS** eliminates stabilizer lumps, permitting full utilization of all the stabilizer for which you pay. **ILS** needs no pre-mixing with sugar or any other product. You simply pour **ILS** into your mix — hot or cold. It disperses instantly . . . hydrates instantly . . . and instantly provides top-quality stabilization.

**Q.** How does ILS benefit your end-product?

**A.** ILS does much to **improve** your products. You get better distribution of the ingredients used. Besides, you are always sure of excellent protection of texture on prolonged storage under all conditions through superior stabilization.

**Q.** How is it possible that ILS is "tailor-made" to suit individual processing needs?

**A.** ILS is made to your order with any basic materials you want, to give you any type body and texture you like! Add this to improved volume and simplified production and you can immediately foresee your profit-advantages.

**(And don't forget — ILS is also available in fully emulsified form at no additional cost. You get your emulsifier "built-in.")**

**ALWAYS USE VEGETABLE GUMS OR STABILIZERS IN ILS FORM.**

Write our Technical Service Staff for complete information.

*Registered trade mark for American Food Laboratories' *Instant Liquid Stabilizer*. Product and AMFOLAB process Patented.

CARE AND CONTROL ★

**AMERICAN FOOD LABORATORIES, INC.**

1000 STANLEY AVENUE, BROOKLYN 8, N. Y.
1442 FLOWER STREET, GLENDALE 1, CALIFORNIA
PHILADELPHIA · BALTIMORE · DETROIT · CHICAGO · DALLAS


**For more information on ad at right, circle 7180**

apparently retains moisture and prevents syneresis or weeping on prolonged storage.

**Results:** Shelf life immediately jumped to five months and beyond, far above normal commercial requirements.

During this period, there is no sign of moisture weeping, and the product retains its fresh tenderness and spongy texture. Doumak "Pixie" brand is the No. 1 seller in the West.

(W-13 waxy maize starch is a product of American Maize-Products Co., 113th St. and Indianapolis Blvd., Roby, Ind.) 7182 on Reader Service Slip.

### Annatto food colors become more important

Because of the current controversy over certain artificial food colorings, Annatto food colors are gaining increased importance for the food industry. They have been used for many years by the dairy industry in the manufacture of cheese, butter, ice cream and related products.

Standard formulations are now available which will meet the requirements of most water- and oil-based food products.

This includes an alkaline extraction of Annatto, which is water soluble, used for coloring cheese and in the ice cream industry to give a rich cream shade. It may also be used for coloring other water-based materials where a reddish-orange color is desired.

There is also a refined water-soluble powder from the extraction of Annatto seeds. It has approximately ten times the coloring power of the alkaline extraction of Annatto and gives an orange to red color in water-base products.

To give a very yellow color in margarine and bakery foods, a blend of vegetable colors in an edible vehicle is available. The principal components are turmeric and Annatto.

Recommended for use in cheese, bakery foods, soups and other foods having a water base is a vegetable color in an edible water-soluble vehicle.

**STARCHES and SYRUPS**

# Keep your product in her cart ...week after week

Corn starches and syrups are time-tested, nourishing, economical carbohydrates. They've long been used and accepted as foods and food ingredients. They may be the answer to problems you have resulting from recent legislation regarding foods because:

In addition to being time-tested, nourishing, economical carbohydrates, corn starches and syrups can provide valuable functional properties as:

• Stabilizers • Emulsifiers • Binders • Humectants • Bland sweeteners • Texturizers • Preservatives (of natural body and color) • Thickeners (for consistency control) • Sugar Crystalization control • Coatings—Glazes

**CORN STARCH** is ideal for baking, baking powder, meats, mustard, salad dressing, custards, pudding, canned soups, etc.

**CORN SYRUPS** are used in mixed syrups, infant foods, preserves, jams, jellies, baked beans, sausage and cured meats, frozen and canned fruits, frozen deserts and many other products.

**CORN SYRUP SOLIDS** are widely used in ice cream, baked goods, frozen fruits, dry food mixes, jams, jellies, table ready and canned meats, to mention just a few.

Whatever you may be processing OK BRAND corn syrups or starches will help you keep your product in her cart week after week.

**Call the Man from Hubinger** ...his service is freely available. Write, wire or phone today.

**THE HUBINGER COMPANY**
**Keokuk, Iowa**

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*You can depend on* HUBINGER... *fast shipment by rail... prompt delivery by truck*

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It is protein- and water-soluble and imparts yellow to reddish orange color.

To impart a yellow color in oil-based foods, a standard vegetable color in an edible oil-soluble vehicle is available. It is recommended for use in butter, shortening, lard, bakery products, cheese, confections, popcorn, curled corn and edible oils.

Custom blends are available on special request.

(Free samples of any of the standard formulations are available on request from Marschall Dairy Laboratory, Inc., PO Box 592, Madison 1, Wis.)
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### New supplier of citric acid

A new source of supply for citric acid is now available to food processors from the Bzura Chemical Company, Inc., Keyport, N. J.

Manufactured from the most basic carbohydrate source, black-strap molasses, citric acid is produced by an exclusive and rapid deep fermentation process. Product, used as

Typical developmental fermentation equipment

a synthetic oxidant and for adjusting the acidity (pH) of many foods, is available in the form of anhydrous or monohydrate colorless crystals or white powder.

Complete description and specifications are outlined in 4-page illustrated brochure.

(Bul 601C on "Citric Acid" is available from Bzura Chemical Co., Inc., Keyport, N.J.)
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**Emulsify without red tape**

This is a safe food emulsifier. You can use it tomorrow without getting approval from FDA. It is exempt from the food additives amendment. It's one of our *Myverol®* ***Distilled Monoglycerides*** prepared from the glycerolysis of edible fats or oils. It is bland, stable, high in monoester content and purity. It emulsifies at lowest possible cost. To get more information about it, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

*distillers of monoglycerides made from natural fats and oils*

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

**Distillation Products Industries** *is a division of* **Eastman Kodak Company**

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*Radioisotope tracers . . .*

# An important aid to non-intentional additive studies

**Tracer techniques enable food researchers to quickly acquire the necessary information on the presence of additives in concentrations as small as parts per million or parts per billion**

**Dr. ROBERT L. BOGNER**
Senior Pharmacologist
Nuclear Science and Engineering Corporation
Pittsburgh, Pennsylvania

DETERMINING the identity and quantity of indirect or incidental food additives presents a tremendous challenge to the food industry. These indirectly added materials, of unknown composition, may present a formidable problem of identification and measurement because they are usually present, if at all, in minute amounts and in complex media.

They are not added directly to a food product for any functional purpose. Rather, they may be incorporated into foods as a result of processing, packaging, storing, etc.

Included in this category are substances that might migrate or transfer from a food wrapper or container (inks, dyes, coatings and adhesives used on packaging), chemicals which find their way into foods from the processing equipment, conveyor belts, plastic or rubber tubing, etc.

They may also occur as residues in foods from meat-, milk- and egg-producing animals treated with veterinary medications or receiving feed supplements as part of their diets.

Furthermore, indirect additives may also become part of the final food product from certain agricultural chemicals such as weed killers and pesticides.

The problem then, is to find out what migrates in order to know if its safety has already been established. Second, it is important to know how much migrates. Often a substance is considered safe if found in foods at a low enough level, but harmful if it exceeds certain limits.

Of course, there is the possibility that there is no migration at all, in which case the problem is eliminated entirely.

Conventional analytical techniques may fail to detect residues, reaction or conversion products and metabolites that must be considered in a comprehensive investigation of the use and fate of such additives.

**Radiotracer techniques.** Very often these additives must be detected in the sensitive range of parts per million or parts per billion. In this case, radioisotope tracer techniques often provide the only, and certainly the most rapid, economical and valid way of testing.

Radiotracers are isotopically-labeled materials. The radiolabel can be detected in minute amounts regardless of where the material goes and irrespective of what happens to the material. Thus, use of tracers permits measurements with extreme sensitivity and specificity.

Conventional testing methods, utilizing absorptiometric principles, are complicated by the presence of interfering materials in many test systems and by the fact that the methods are usually only satisfactory for a specific chemical structure and not breakdown or altered products. Radiotracer detection is not affected by "blanks", non-radioactive interfering substances and changes in chemical composition.

Results of radiotracer tests will be most valid when the product under tests, containing the labeled material, is identical to the commercial product with the exception that a portion of the usual stable, non-radioactive content of a compound is replaced by an equal wieght of the tagged compound.

Fulfilling this production or processing necessity requires that the radio-compound (ink, stabilizer, adhesive, tape, etc.), of interest, must be incorporated into the production process at the same time and in the same fashion as is custom.

Because of costs and possible contamination considerations, incorporation is not always feasible by the customary manufacturing or processing methods. Therefore, a research, pilot-scale or laboratory modification must be utilized.

However, addition of radiotracers to standard fermentation tanks, paper manufacturing machines, batch mixers and actual food processing lines has been possible.

**Radioactive experimental products.** Tests should be undertaken to establish that the radioactive experimental product, produced under pilot-scale conditions, should meet the same specifications as its commercial counterpart.

An experimental radioactive aerosol for instance, should meet the same standards of spray rate, particle size, etc. as the actual consumer product. Likewise, a labeled food package should meet the same quality control standards as the usual package.

**Residue and reaction-product experiments.** In the case of a radioisotope-labeled solvent in residue and reaction-product experiments, a scaled down laboratory technique must be developed and employed for the food exposure tests unless the par-

Spraying a cow with a radio-active-labeled insecticide is the initial step in determining whether the insecticide appears in the final milk product as an incidental additive

ticular radioisotope preparation can be introduced in actual processing phases.

In solvent extraction studies, it is essential that the experiments be designed not only to measure the intact, unaltered solvent residues, but also to detect and identify, if possible, products formed by the solvents with food constituents.

Methyl bromide, for example, can react with the amidezole ring of the amino acid listidine. The methylated reaction-product therefore, may be considered a food additive.

Radiotracer techniques have been employed to investigate residues and conversion products of several radioactive solvents in food and kindred products. Whereas the commercial process may utilize five gallons of solvent "X" to extract oil containing ingredients from five pounds of a food product, the tracer studies may be conducted with 20 milliliters of radioactive solvent and two grains of food product.

Solvent removal has been achieved by filtering. The food product was then subjected to various procedures of desolventization and radioactive counts were made to determine residual solvent and food-solvent reacting products.

There are several specific examples of the successful utilization of radioisotope tracers in determining the presence of incidental additives in final food products.

Among these have been studies of wax linings in milk containers and lubricants for metal containers, determination of residues of ethylene oxide and methyl bromide as fumigants and metabolic fate and residues of ethylene oxide and methyl bromide as fumigants and metabolic fate and residues of ethoxyquin used in animal feeds as an antioxidant.

**Short-cuts to safety.** Once the chemical identity and the concentration of an incidental additive has been established, an appraisal of the safety of such component must be made unless it is already accepted as safe. Standard tests for evaluating the safety of the incidental additive may take years of animal feed tests to complete.

Numerous applications of radiotracers and radioactive indicators as applied to food additives safety problems can be cited.

For example, interconversion of an "additive" and a normal metabolite of an established biochemical pattern, as detected with labeled tracers, has substantiated safety expectations. In one particular case, interconversion of cetyl alcohol and palmitic acid substantiated, by tracer techniques, that the alcohol could be considered a normal intermediate in fat metabolism.

Likewise, the non-residual nature of an additive in the body can be revealed by following excretion and fate of tagged forms, complete elimination or total incorporation into normal body chemicals related to slight hazard.

Excretion of radio-active-labeled oxygen in the exposed air and autopsy levels of a radiotagged food additive provides considerable information on the type and extent of toxicology to be expected. Such information will enable a more specific design of toxicology studies to obtain safety data.

Moreover, lack of interference of additives on metabolism of labeled metabolic biological fuels substantiates and complements safety evaluation.

For example, recent evidence in isotope literature reveals that toxic effects of carbon tetrachloride and parathion in animals can be detected by measuring changes in the metabolism of a normal nutrient, radioactive-labeled glucose. Such measurements of radioactive metabolic patterns after treatment with food additives can serve as preliminary and rapid toxicity screening techniques. END

For FOODS with a
Flavor
Flair
USE
KATER BRAND "Deep Smoked" Yeasts
VICO BF Flavors

KATER BRAND "Deep Smoked" Yeast — either Brewer's Yeast or Torula Yeast — impart the natural aroma and flavor of true hickory smoke to foods giving them gourmet appeal. Their high smoke concentration, free from harsh or bitter after-tastes, permits balanced flavor at remarkable economy.

KATER BRAND "Deep Smoked" Yeasts combine high purity with flavor stability and nutrition values. As NATURAL FOOD PRODUCTS — not additives — they are acceptable under all regulations of the U.S. Food, Drug, and Cosmetics Act and are approved for certain applications in federally inspected meat plants.

VICO BF Flavors developed and compounded by specialists skilled in flavor processing for over 25 years provide tempting aroma and appetite stimulating meat-like flavor. Completely soluble in water, they are offered in dry or paste form.

Both KATER BRAND "Deep Smoked" Yeasts and VICO BF Flavors increase the sales potential of a great variety of foods and specialty products. Ease of handling, guaranteed uniformity, ready availability, stability and economy make both quality ingredients the choice of discriminating food manufacturers. Consult with us for personalized service and assistance in your food product development program.

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Manufacturing chemists for the food and pharmaceutical industries.
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# Safe Additives for Use in Meat Products, Including Shortening

**Intentional and incidental chemical additives, cleared by USDA for use in Federally inspected meat plants, are exempt from FDA approval**

A large number of intentional and incidental chemical additives are recognized as safe by the Meat Inspection Division of USDA for use with meat products, including shortening. These additives are generally recognized as safe by FDA when used in Federally inspected meat plants.

Both the intentional and the incidental additives, which fall within this category, are listed below.

First is a listing of intentional additives, their purpose, the products in which they may be used and the limitations of use, as established by the Meat Inspection Division.

This is followed by a list of acceptable incidental additives for basic plastic materials which come in contact with meat products.

## Permitted intentional chemical additives for use in meat products, including shortening

| Additives | Purpose | Products | Amount |
|---|---|---|---|
| Acetic acid | Refining | Rendered fats | Sufficient for Purpose |
| Amines, filming | Volatile boiler additive to retard corrosion in pipes | Steam | See chemical names |
| Anti-foam A (methyl polysilicone) | To retard foaming | Soup | 10 PPM |
| Antioxidants (oxygen interceptors) | To retard rancidity development | Lard and shortening | 0.01% singly; 0.02% combinations |
| Ascorbic acid | Accelerate color fixing in curing | Cured cuts; cured comminuted product | 7½ ozs to 100 gals pickle; ¾ oz to 100 lbs meat |
| Bacterial starter; lactic acid starter culture | To develop flavor | Dry sausage; pork roll | 0.5% |
| Benzoate, sodium; benzoic acid | To retard flavor reversion | Oleomargarine | 0.1% |
| BHA (butylated hydroxyanisole) | Antioxidant: To retard rancidity development | Lard and shortening | 0.01% |
| | Antioxidant: To retard rancidity development | Unsmoked dry sausage | 0.003% |
| BHT (butylated hydroxytoluene) | Antioxidant: To retard rancidity development | Lard and shortening | 0.01% |
| Bicarbonate of soda | To neutralize excess acidity; cleaning vegetables | Rendered fats; tomato soup; beans, etc. | Sufficient for purpose |
| Borax | Preservative | Export | Sufficient for purpose |
| Bromelin | Same use as papain | | |
| Carbon (purified charcoal) | Refining | Rendered fat | Sufficient for purpose |
| Carbon dioxide gas | Immobilizing | Hogs | Sufficient for purpose |
| Caseinate, sodium | Binder and extender | Imitation sausage; nonspecific loaves; soups; stews; etc. | Sufficient for purpose |
| Caustic soda (sodium hydroxide) | Refining; denuding | Fats; tripe | Sufficient for purpose |
| Cellulose gum (carboxymethyl cellulose) | Extender, stabilizer | Baked pies, etc. | Sufficient for purpose |



For more information on ad at right circle 7187 opposite back cover.

# How much more does quality cost?

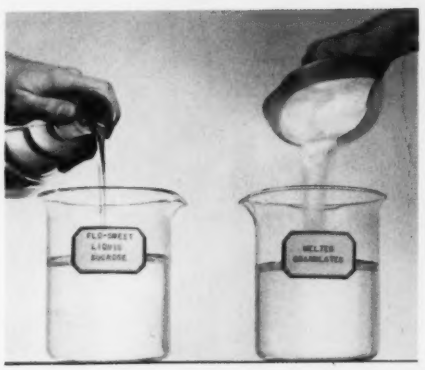
*Not a penny*, when you use Flo-Sweet for sweetening!

In fact, Flo-Sweet *saves* you money in a number of important ways. By eliminating manual handling of sugar. By avoiding sugar melting costs. In many areas, in the cost of sugar itself.

But a vital reason for the revolution that Flo-Sweet is making in food processing is *quality*. Flo-Sweet liquid sugars make possible a degree of quality control, and even quality improvement, that is difficult or too expensive with ordinary granulated.

You can easily verify Flo-Sweet's higher quality yourself, through the simple test shown at the right. Just dissolve some of your favorite granulated . . . concentrate it to 67° Brix . . . and compare its color with that of Flo-Sweet liquid sucrose.

Your Flo-Sweet engineer will be glad to help you explore ways to use Flo-Sweet liquid sugars in cutting costs while boosting quality. Why not consult him soon?




**REFINED SYRUPS & SUGARS, INC.**

YONKERS, NEW YORK

SERVING INDUSTRIAL SUGAR USERS EXCLUSIVELY FROM YONKERS, ALLENTOWN, DETROIT, TOLEDO

FLO-SWEET®

FIRST IN LIQUID SUGAR

| Additives | Purpose | Products | Amount |
|---|---|---|---|
| Citric acid | Synergist; To increase effectiveness of antioxidants | Lard and shortening | 0.01% |
| | Synergist: To increase effectiveness of antioxidants | Unsmoked dry sausage | 0.01% |
| | To protect flavor | Oleomargarine | Sufficient for purpose |
| | Flavoring | Chili con carne | Sufficient for purpose |
| Citric acid and sodium citrate | Prevent coagulation | Beef blood | 0.2% |
| Coloring material, vegetable, and synthetic | To color casings, rendered fat, marking ink, etc. | Sausage casings; oleomargarine; shortening; branding ink | Sufficient for purpose |
| Corn syrup | Flavor; cure | Cured product; hamburger | 2.5% |
| Corn syrup dried | Flavor; cure | Cured product; hamburger | 2.0% |
| Cyclamate, sodium | Sweetener | Bacon | 0.15% |
| Cyclohexylamine | To retard corrosion | Boiler water | 10 ppm from approved feeder |
| Dextrose | Flavor; cure; seasoning | Sausage, ham, etc. | Sufficient for purpose |
| Diacetyl | Flavor | Oleomargarine | Sufficient for purpose |
| Diatomaceous earth | Refining | Rendered fats | Sufficient for purpose |
| Dry ice (carbon dioxide-solid) | Cooling | Chopping of meat; packaging of product | Sufficient for purpose |
| Enzymes, proteolytic | (See papain, bromelin, ficin) | | |
| Ficin | Same use as papain | | |
| Fullers earth | Refining | Rendered fats | Sufficient for purpose |
| Glycerol (glycerine) | Inhibit drying; manufacture of mono- & diglycerides | Seasonings, curing mixes | Sufficient for purpose |
| Glycerol lactopalmitate, etc. | A type of mono- & diglycerides | Shortening | Sufficient for purpose |
| Gums, vegetable (tragacanth, karaya, etc.) | Emulsifying agent; binder | Spice emulsion; egg roll, breading mix | Sufficient for purpose |
| Hydrogen peroxide | Bleach | Tripe | Sufficient for purpose |
| Hydrolyzed plant protein | Flavor | Various | Sufficient for purpose |
| Isoascorbic acid | Accelerate color fixing in curing | Cured cuts; cured comminuted product | 7½ ozs to 100 gals pickle; ¾ oz to 100 lbs meat |
| Isopropyl citrates | To protect flavor | Oleomargarine | 0.02% |
| Lecithin | To retard rancidity development; emulsifier | Lard and shortening | Sufficient for purpose |
| | Emulsifier | Oleomargarine | 0.5% |
| Lignin | Loosen scale | Steam boilers | Sufficient for purpose |
| Lime | Denude | Tripe | Sufficient for purpose |
| Malt syrup | Flavor, cure | Cured product | 2.5% |
| Mono- and diglycerides | Emulsifiers | Lard, shortening; Oleomargarine | Sufficient for purpose; 0.5% in oleomargarine |
| Monoisopropyl citrate | To increase effectiveness of antioxidants | Lard, shortening, oleomargarine | 0.01% in lard & shortening; 0.02% in oleomargarine |
| Monosodium glutamate | Flavor | Various | Sufficient for purpose |
| Morpholine | To retard corrosion | Boiler water | 10 ppm from approved feeder |
| Nickel | Catalyst | Hydrogenated fats | Sufficient for purpose |
| Nitrate of soda or potassium | Source of nitrite | Cured products | See sodium or potassium nitrate |
| Nitrite of soda or potassium | Fix color | Cured products | See sodium or potassium nitrite |
| Nitrogen | Exclude oxygen | Sealed products | Sufficient for purpose |
| Nordihydroguaiaretic acid (NDGA) | Antioxidant: To retard rancidity development | Lard and shortening | 0.01% |
| Octadecylamine | Boiler additive to retard corrosion in steam pipes | Steam | 2.5 ppm in condensed steam (analysis required) |
| Oxygen interceptor | See antioxidants | | |
| Papain | Soften tissue | Frozen cuts | Sufficient for purpose |
| Phosphates: disodium; sodium hexameta-; tripoly-; sodium pyro-; sodium acid pyrophosphate | Decrease amount of cooked-out juices | Ham, pork shoulder picnic; canned chopped ham | 5.0% in pumping pickle; 0.5% in canned chopped ham |

| Additives | Purpose | Products | Amount |
|---|---|---|---|
| Phosphate, sodium hexameta- | Retard scale formation in pipes | Potable water supply | 10 ppm from approved feeder |
| Phosphate, trisodium | Denuder | Tripe | Sufficient for purpose |
| Phosphoric acid | Synergist: To increase effectiveness of antioxidants | Lard and shortening | 0.01% |
| Propyl gallate | Antioxidant: To retard rancidity development | Lard and shortening | 0.01% |
| Resin guaiac | Antioxidant: To retard rancidity development | Lard and shortening | 0.1% |
| Silica gel | Anti-caking agent | Curing mixes, etc. | 0.5% |
| Sodium ascorbate; sodium isoascorbate | Accelerate color fixing in curing | Cured cuts; cured comminuted product | 7½ ozs. to 100 gals. pickle; ⅞ oz. to 100 lbs. meat; 10% solution to surface of cured product prior to packaging |
| Sodium bicarbonate | See Bicarbonate of soda | | |
| Sodium carbonate | Refining; denuding | Fats; tripe | Sufficient for purpose |
| Sodium caseinate | Binder and extender | Imitation sausage; non-specific loaves; soups; stews; etc. | Sufficient for purpose |
| Sodium hydroxide (caustic soda) | Denuder | Tripe | Sufficient for purpose |
| Sodium metasilicate | Denuder | Tripe | Sufficient for purpose |
| Sodium or potassium nitrate | Source of nitrite | Cured products | 7 lbs to 100 gals pickle; 3½ ozs. to 100 lbs meat (dry cure); 2¾ ozs to 100 lbs chopped meat |
| Sodium or potassium-nitrite | Color fixing | Cured products | 200 ppm (02%) in product; 2 lbs to 100 gals pickle; 1 oz to 100 lbs meat (dry cure); ¼ oz to 100 lbs chopped meat |
| Sodium sulfoacetate derivatives of mono- and diglycerides | Emulsifier | Oleomargarine | 0.5% |
| Sorbitol | Retard drying | Seasonings | Sufficient for purpose |
| Starter distillate | Flavor | Oleomargarine | Sufficient for purpose |
| Stearyl citrate | To protect flavor | Oleomargarine | 0.15% |
| Sugars, approved (sucrose and dextrose) | Flavoring; curing; seasoning | Sausage, ham, miscellaneous | Sufficient for purpose |
| Sulphites with strong alkali | Retard corrosion | Boiler water | Sufficient for purpose |
| Tannic acid | Refining; loosen scale | Rendered fats; boiler water | Sufficient for purpose |
| Tocopherols | Antioxidant: To retard rancidity development | Lard and shortening | 0.03% |
| Trisodium phosphate | Denuder | Tripe | Sufficient for purpose |

### Hydrolyzed milk protein

**Note:** Hydrolyzed milk protein does not appear in above USDA listing. However, Sheffield Chemical Co., Inc. has a letter from the Meat Inspection Branch, USDA (dated Aug. 7, 1953) stating, in part:

"It has been decided to permit the use of milk protein hydrolysate in meat food products prepared under our supervision on the same basis as monosodium glutamate and hydrolyzed plant protein.

". . . [they] are acceptable for use in accordance with Meat Inspection Memorandum 147. The materials may be listed in the ingredient statement of product in which used, as milk protein hydrolysate or hydrolyzed milk protein."

## Acceptable Materials For Plastics Which Come In Contact With Meat Products

### RESINS

**A. Can enamels — the classes of resins that have been met with most frequently are:**

Bisphenol-epichlorhydrin
Bisphenol-epichlorhydrin esters
Epoxy Ester
Bisphenol-epichlorhydrin-vinyl
Certain modified phenols
Certain modified vinyls
Oleoresins
Alkyl oleoresins
Polyester
Alkyl ester

**The basic types of resins may be listed as follows**

Fossil resins, specifically gilsonite, and natural East Indian and Congo resins
Bisphenol-formaldehyde
Certain substituted phenol formaldehydes
Phenol formaldehyde
Urea formaldehyde
Bisphenol-epichlorhydrin
Bisphenol-epichlorhydrin esters
Maleic anhydride resin ester
Esterified Congo resin
Esterified resin
Melamine-formaldehyde
Polyvinyl chloride and acetate
Cellulose acetate butyrate
Polystyrene
Polyvinyl butyral
Polyethylene
Petroleum hydrocarbon

**B. Films for wrapping foods**

**The acceptable resins for wrapping foods are:**

Condensate of dimethyl terephthalate and ethylene glycol
Resins from high and low viscosity polyvinyl alcohol for fatty foods only
Polyvinyl chloride
Polyvinyl acetate
Polyvinyl chloride-acetate
Vinylidine chloride
Polystyrene
Polyethylene of the high and low pres-


KESCO vital wheat gluten adds PROTEIN to your products... VITALITY to your sales

Today's consumers are "high protein" conscious. You can meet this demand for protein in your new products with the addition of small amounts of Kesco Vital Wheat Gluten to your formula.

Many food processors are also putting new life in established products by adding Kesco Vital Wheat Gluten. Such "renewed" products are often marketed at premium prices.

Kesco Vital Wheat Gluten has no taste . . . will not change flavor of original product. But, it does give you a strong new selling feature.

For samples, prices and more information on the many possible uses of Kesco Vital Wheat Gluten call or write:

THE KEEVER STARCH CO.
538 East Town Street
Columbus 15, Ohio

*Processors of grain products for industry since 1898*

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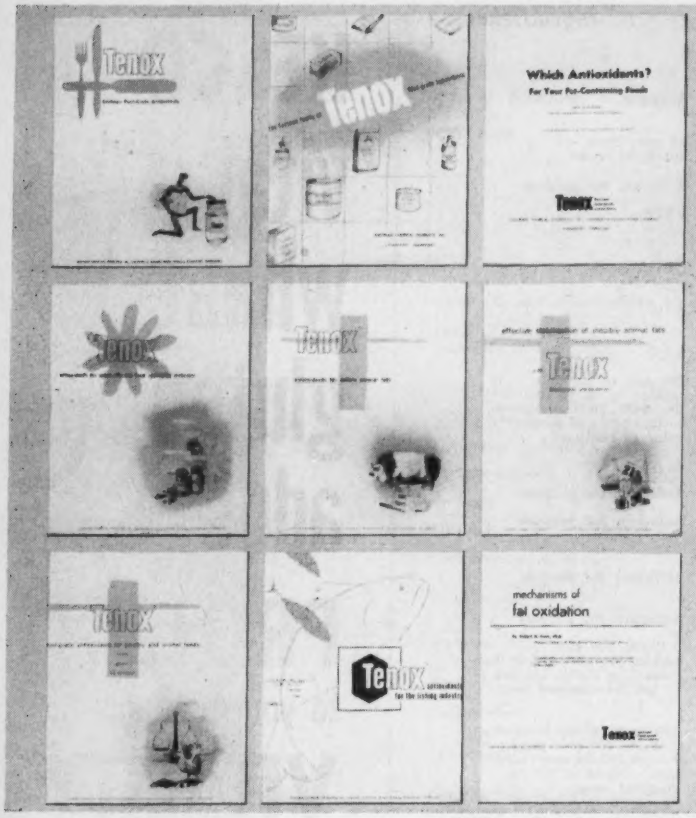


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- Which antioxidants for your fat-containing foods?
- Tenox antioxidants for more effective food packaging materials
- Tenox antioxidants for edible animal fats
- Effective stabilization of inedible animal fats with Tenox
- Tenox feed-grade antioxidants for poultry and animal feeds
- Tenox antioxidants for the fishing industry
- Mechanisms of fat oxidation

Eastman manufactures all the principal types of food-grade antioxidants in use today and supplies them in a variety of formulations. Because of this unique position we can suggest the antioxidant or formulation most effective for your product. Behind this service is a fully-equipped laboratory staffed with antioxidant specialists with years of experience in the food field.

For your copy of any of these pieces of literature, write Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Company, Kingsport, Tennessee.

**Tenox**® Eastman food-grade antioxidants

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# WHITTEN

## Quick-Prep Ice Cream Gelatin

**A very fast dissolving gelatin where the ice cream mix is pasteurized at high temperatures for short periods. High resistance to breakdown. . . .excellent for restraining heat shock and shrinkage.**

## Hypowr Gelatin

**The extra-high strength gelatin that costs less to use. For desserts, marshmallow, jellied soups and meats.**

**ORDER A TRIAL DRUM TODAY**

**J. O. WHITTEN CO., INC.**
**Winchester, Mass.**

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# GELATIN

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sure type
Cellulose acetate
Regenerated cellulose
Butadiene-acrylonitrile synthetic rubber
Methyl and ethyl acrylate
Ethyl cellulose
Rubber hydrochloride
Polyester resin—ethylene terephthalate and ethylene isophthalate
Butadiene acrylonitrile-styrene copolymer
Butadiene-styrene copolymer
Terephthalic acid-ethylene glycol copolymer

### C. Grease-proofing and wet-strength resins for paper wraps

Polymer of 2-chloro-butadiene
Polymer of melamine-formaldehyde
Polymer of urea-formaldehyde
Polymer of dimethyl-polysiloxane of 350 centistokes viscosity
Copolymer of styrene and isobutylene (for foods of high water content only)

### Plasticizers

Acetyl tributyl citrate
Acetyl triethyl citrate
Butyl stearate
Butyl phthalyl butyl glycollate
p-Tertiary butyl phenyl salicylate
Dibutyl sebacate
Di-iso butyl adipate
Di-2-ethylhexyl phthalate (for foods of high water content only)
Di-iso-octyl phthalate
Diethyl phthalate
2-Ethylhexyl diphenyl phosphate
Ethyl phthalyl ethyl glycollate
Glycerin
Glyceryl monooleate
Glycerin triacetate
Monoisopropyl citrate
Paraplex G-60
Paraplex G-62
Stearyl citrate
Triethyl citrate
3-(2-Xenoxy) -1, 2-epoxypropane

### Stabilizers

Aluminum monostearate
Ammonium citrate
Ammonium potassium phosphate
Calcium acetate
Calcium carbonate
Calcium ethyl acetoacetate acetate
Calcium glycerophosphate
Mono-, di- and tricalcium phosphate
Calcium oleate
Calcium ricinoleate
Calcium stearate
Magnesium glycerophosphate
Magnesium stearate
Mono-di- and trimagnesium phosphate
Potassium citrate
Disodium hydrogen phosphate
Sodium citrate
Sodium pyrophosphate
Sodium tetrapyrophosphate
Tin stearate
Inorganic salts of copper-manganese, and zinc, zinc stearate and zinc resinate, are acceptable if the leaching of the metal contributes less than 50 ppm to the food.

### Driers

Cobalt caprylate, linoleate, naphthenate, and tallate
Iron caprylate, linoleate, naphthenate, and tallate
Manganese caprylate, linoleate, naphthenate, and tallate

### Drying Oils

Chinawood oil
Dehydrated castor oil
Linseed oil
Tall oil

### Colorants (Pigments)

Carbon black
Oxides of iron
Titanium dioxide NF
Ultramarine blue

### Release Agents

Acrowax C
DC Fluid 200 of 60,000 centistokes viscosity
Methyl polysiloxane of 350 centistokes

viscosity
Microcrystalline wax
Linoleic acid amide
Polmitic acid amide
Stearic acid amide
Polyethylene glycol 400
Polyethylene glycol 1500
Polyethylene glycol 4000
Polytetrafluoroethylene
Oleic acid amide

### Trough grease contains no mineral oil

Trough grease, for easy dough handling in the baking industry, is guaranteed to contain no mineral oil. It is manufactured in desired viscosities for use either in a spray gun or for hand or brush application.

It coats and cleans interior of dough troughs and hoppers and will not gum, oxidize, become rancid, discolor the dough, cause odors or leave a taste.

Trough grease is available in 410-pound, net, fibre drums.

(Trough grease is a product of Mallet & Company, Inc., PO Box 474, Carnegie, Pa.)
7191 on Reader Service Slip.

**Refined analytical equipment and techniques, including radioactive tracer probings, aid in . . .**

## Establishing Safety of Rubber Products Which Have Contact With Food

A special chemical laboratory, set up by the B. F. Goodrich Company, Akron, Ohio, to establish a food additives evaluation program, has successfully conducted test which meets the requirements of safety for various rubber food-handling products under the Food Additives Amendment.

Included on the list of FDA-approved rubber products that come in contact with foods are a series of conveyor belts, brewery hose and rubber inflations for milking cows on a production line basis.

FDA-approved rubber and Koroseal vinyl conveyor belts are available for all food-han-


*For Food Processing*

There's No Substitute for "Know How"...

. . . In the manufacture of *Clinton Products from corn* for use as ingredients for food applications

**corn syrups • corn starches**
**dextrose • refined corn oil**
**lactic acid**

See your Clinton salesman today.

**CLINTON TECHNICAL SERVICE** is freely available upon request.

CLINTON

**CLINTON CORN PROCESSING COMPANY, CLINTON, IOWA**

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KELCO COMPANY

technical bulletin

REFINED ALGIN PRODUCTS

*Use unique Kelco Algin Colloids to improve your food products*

**In Frozen Foods, Kelcoloid,** in acid to neutral foods having oil-water systems, provides emulsion stability. Coarse ice crystal formation is retarded. Kelcoloid holds structure of food, maintains smooth uniform texture, and promotes complete flavor release.

**In Gravies, and in Cream, Meat and Barbecue Sauces,** Kelcoloid provides efficient emulsion stability, and aids in thickening and bodying, too. Kelcoloid produces properly stabilized, free-flowing sauces that are homogeneous and eye appealing, with clean full flavor. Shelf life is measurably extended.

**In Salad Dressings,** Kelcoloid, highly efficient stabilizer, prevents body separation and markedly increases shelf life. Kelcoloid promotes a uniform, smooth consistency giving dressings a highly desirable, palatable appearance.

# No Surer Way to Achieve Effective Emulsion Stability

**KELCOLOID HVF,** the high viscosity member of this series, is generally recommended for use where a decided increase in viscosity is desired along with effective emulsion stability.

**KELCOLOID LVF,** the low viscosity member of this algin series, produces excellent emulsion stability and desirable body qualities. The LVF is recommended for use where a high degree of emulsion stability is desired with a minimum change in viscosity and body properties.

**YOURS ON REQUEST:** Free samples of KELCOLOID and other Kelco algin products, plus Technical Data describing properties, advantages and uses. At your service, too, are highly qualified food technicians ready to give individual attention to your problems. Write without obligation to your nearest Kelco regional office.

**Kelcoloid HVF® Kelcoloid LVF® products of Kelco Company**

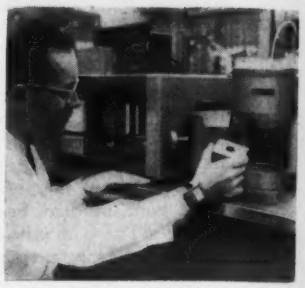
75 Terminal Avenue, Clark, N. J. • 20 N. Wacker Drive, Chicago 6, Ill. • 530 W. Sixth Street, Los Angeles 14, Calif.
Cable Address: KELCOALGIN — CLARKNEWJERSEY

7193 on Reader Service Slip.



dling operations, including fatty, aqueous and dry food categories.

Rubber products which come in contact with food are of concern under the Food Additives Amendment because rubber is compounded from a variety of materials and chemicals. These materials and chemicals, which add the necessary "use qualities" to give rubber resistance to deteriorating affects of heat, oil, abrasion and repeated flexing, might "extract" or migrate into foods with which they come in contact.



**Identifying rubber compounding ingredients that migrate into food sometimes requires a radioactive tracer research. In the above photo, a sample of food-handling rubber compound is being placed in the sample chamber of a laboratory Geiger counter. The rubber contains a radioactive compounding ingredient. This sample will be used in an "extraction" test. It will be placed in a liquid and heated for 30 days at temperatures up to 200 F. Liquid's radioactivity will then be measured to determine how much, if any, of the radioactive compounding ingredient has leached out as a potential food additive**

Laboratory studies show that migration is primarily a leaching process, usually an interchange between a liquid food phase and the rubber or plastic. Available quantities of leached out material are never more than minute, trace quantities which defy analysis by any but the most sensitive scientific instruments.

To speed up detection of any chemicals which might migrate from rubber products into foods, B. F. Goodrich labs makes liberal use of refined analytical equipment.

This includes the spectrophotometer, mass spectrometer, electron microscope, gas chromatography techniques and radioactive tracer probings involving radiation research with "tagged atoms."

If any offending elements are discovered, the next step is to determine whether or not they are harmful to humans. The goal is to establish "safety at use" levels and to qualify these tolerance levels with the FDA.

Thousands of successful experiments have been conducted by B. F. Goodrich, qualifying materials traditionally used in the rubber industry or establishing acceptability of new materials which do a better job than those previously used.

### Dairy ingredient to meet wider range of bakery requirements

New spray-dried dairy ingredient is made to meet a wider range of bakery requirements than can be obtained from spray-dried whey. Product is prepared from sweet whey, especially formulated, processed and supplemented with calcium salts and milk proteins so that its absorption approaches that of non-fat milk solids.

It has the same absorption as non-fat milk solids up to a four per cent level. In formulas where up to four per cent non-fat milk solids are specified, it replaces non-fat pound for pound.

It provides less bulky, smooth, pliable doughs that give less trouble in rounders and molders. It also develops a more golden brown color, produces a slightly softer crumb and retards staling.

Various components making up the dairy ingredients for bakers are provided for in the definitions and standards under the Federal Food, Drug and Cosmetic Act.

(Kralex blended dairy ingredient for bakers is a product of Kraft Foods, Div. of National Dairy Products Corp., 500 Peshtigo Ct., Chicago 90, Ill.)

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# What's the hidden magic that makes her buy your brand again...and again?

There are many ways to sell a product once . . . but repeat sales depend on the hidden magic of flavor, performance, texture, economy . . . customer satisfaction with your product.

Fast-growing way to achieve these sales assets is with the improvement added by enzymes. And today Miles Chemical is your best source for enzymes. Takamine products offer the widest variety of enzymes available . . . all highly specific in their actions . . . derived from fungal, bacterial, plant, or animal sources . . . and readily inactivated when their job is done.

Beverage or food product . . . Takamine enzymes can consistently help speed up processing, guard color and stability, enhance flavor, protect shelf life . . . endow your products with the hidden magic that captures repeat customers. Let us tell you more about these willing workers from Takamine. All inquiries are handled promptly.

**TODAY'S WIDEST VARIETY OF ENZYMES**

**Amylases** for any degree or kind of starch conversion in baked goods, beer, cereals, chocolate, confectionery, flavors, fruit juices, syrups, and vegetables.

**Proteases** for limited, selective or drastic proteolysis of most proteins in baked goods, beer, cereals, chocolate, meat and fish, and protein hydrolysates.

**Glucose Oxidase** for removing glucose or oxygen in beer, carbonated beverages, milk, eggs, flavors and juices.

**Catalase** to decompose hydrogen peroxide in cheese and egg processing.

**Pectinase** to increase yields, improve color, and speed processing in fruit juices and wine production.

**Another Takamine food enhancer** is sodium erythorbate (sodium isoascorbate) or erythorbic acid, economical antioxidants widely used to improve flavor, appearance and shelf life of many food products.

**It will TASTE better, LOOK better, SELL better with Takamine products.**

TAKAMINE® (pronounce it Tack-a-ME-nee)

Miles Chemical Company

DIVISION OF MILES LABORATORIES, INC., ELKHART, INDIANA

General Sales Office: Elkhart, Indiana, Telephone COngress 4-3111; Clifton, New Jersey, Telephone PRescott 9-4776; New York, N.Y., Telephone MUrray Hill 2-7970.

5-60

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**Sweetose Syrup Enhances Natural Flavor... Brightens Appearance in Fruit Juice Drinks!**

**In jams and jellies . . .** Sweetose brings out true fruit flavor. Gives a brighter appearance and sheen.

**In canned fruit sauces . . .** Sweetose holds appetizing color. Enhances that just-picked flavor with balanced sweetness.

There's no surer, more economical way to improve quality, appearance and flavor in your fruit juice drinks than with Sweetose, Staley's enzyme-converted corn syrup.

Crystal-clear Sweetose assures true *balanced sweetness*. Captures, blends and enhances the various tangy, natural flavors. Holds and brightens true fruit colors.

Investigate the many advantages Sweetose Syrup can bring to your operation. For more information on how you can improve the over-all quality of your fruit juice drinks at *decidedly lower* sweetener costs, see your Staley Representative or write:

A. E. Staley Mfg. Co., Decatur, Ill.

BRANCH OFFICES: ATLANTA • BOSTON • CHICAGO • CLEVELAND • KANSAS CITY • NEW YORK • PHILADELPHIA • SAN FRANCISCO • ST. LOUIS

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*ingredients*

### Compiles 593 additives on "white list"

A composite food additive "white list" of 593 substances has been compiled by Food and Drug Research Laboratories in a 4-page March issue of their "What's New in Food and Drug Research."

List includes those substances employed in food production, processing or packaging, which have been listed by the FDA in the Federal Register as generally recognized as safe when used for the purposes indicated, or sanctioned for specified uses prior to the enactment of the Food Additives Amendment of 1958.

(A limited number of copies of the special issue are available. Letterhead requests should be addressed to Food and Drug Research Laboratories, Inc., Maurice Ave. at 58th St., Maspeth 78, N. Y.)

### Meat extract from whale meat

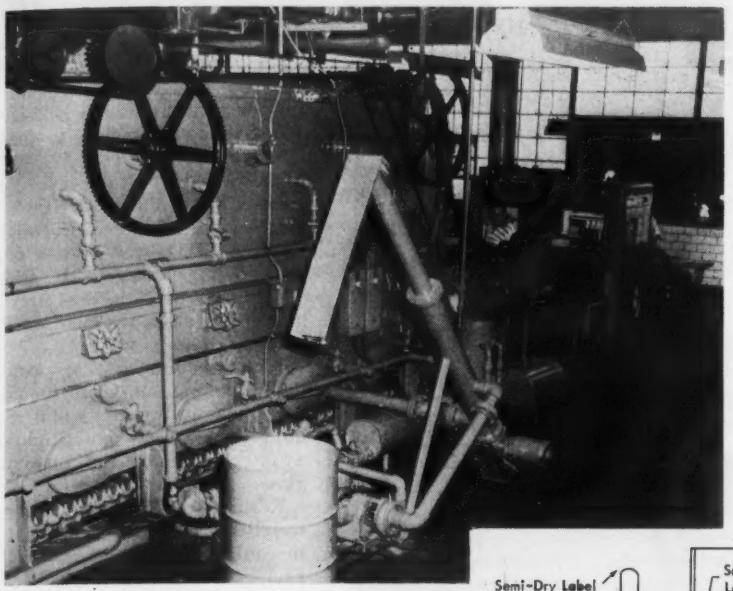
Meat extract, made from whale meat, is used in the same products as beef extract — in meat bouillon cubes, dehydrated soups, etc. as one of the main ingredients, and in many other products as a flavoring agent.

The whale meat extract sells for about one-half the cost of beef extract.

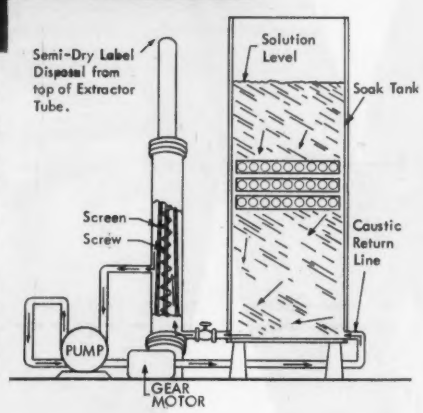
Extract is a pure, genuine meat extract made by water extraction of fresh, lean meat followed by centrifuging, filtering and evaporation steps, and with no use of chemicals. It contains no added salt.

Whale meat extract has a somewhat weaker flavor than beef extract. Therefore, it is recommended that 20 to 30% more whale meat extract be used in formulas designed for beef extract.

("Brinor" whale meat extract is a product of Rieber & Sons Co., Bergen, Norway. Additional information, availability and price may be obtained from Comco Co., 1940 W. Carroll Ave., Chicago 12, Ill.)
7197 on Reader Service Slip.



In most instances, label extraction unit will be installed on the floor next to the soaker in an inclined position as shown in above view. Depending upon particular installation characteristics of bottle washer (whether it is equipped with drain headers, caustic headers, etc.), entire unit will fit into an area extending approximately 5' 6" outside of the washer tank wall. Heart of the unit, shown in inset schematic diagram, is a 4" diameter screw similar to those used in coal stokers. Ingenious employment of powered recirculation of soaker solution assures that labels leave soaker tank as fast as they are removed from bottles. Labels flow from bottom of soaker tank to infeed section of screw. Here, solution is separated from paper for recirculation and paper is carried upward and discharged from unit for collection in drums or directly to sewer if preferred




# Continuously removes labels from bottle washer soaking compartment

**Field tests, and installation in two large Midwest breweries, indicate successful operation with single or multiple dormant soak tanks**

AUTOMATIC, self-contained label extraction unit, continuously removes labels from soaking compartments of bottle washers.

Label extractor is expected to offer tremendous savings over present methods of soaker cleanout, as well as to provide increased or indefinite life of caustic solutions and reduction of personal hazard from contact with caustic soda.

Unit may be direct-connected to a single, conventional dormant soak tank, or may employ a manifolded hookup, operating in conjunction with several dormant soak tanks. (See photo and schematic diagram)

In field trials, it has been successfully operated at two large Midwest breweries. At one of the breweries, unit is installed in the second compartment of a 24-wide soaker. Soaker, which was normally cleaned after 80 to 100 hours of operation, was always heavily packed with labels after the operating period.

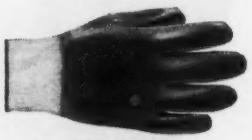
EDMONT CASE NO. 636: Icing refrigerator cars, $16.67 a dozen neoprene gauntlets lasted 20 shifts. Edmont recommended a lower priced plastic coated No. 414 Snorkel, which wore over 40 shifts, at more than 50% saving.

## EDMONT GLOVE CUT COSTS IN HALF, HANDLING ICE

In the case above, the Edmont-recommended Snorkel glove wore more than twice as long because it fit the job. Its vinyl coating has a special finish which gives excellent wet grip. Extremely flexible jersey liner, wing thumb and curved, pre-flexed finger pattern aid dexterity. *Extra-coating* on palm now gives 20% longer wear.

No. 414 SNORKEL
vinyl plastic coating

EDMONT CASE No. 612: In a West Coast fish cannery, cotton gloves lasted only half a shift. Edmont recommended a rough finished, natural rubber coated glove (No. 660W Grab-it) which wore as long as 28 shifts, reducing monthly glove costs per worker from $7.60 to 61¢.



No. 660W GRAB-IT
rough rubber coating

EDMONT CASE No. 637: Handling wire-bound crates of poultry wore out ordinary plastic coated gloves in 6 shifts. Edmont recommended the plastic coated No. 404 Snorkel. It wore 20 shifts, reduced glove costs 75%.

No. 404 SNORKEL
vinyl plastic coating

FREE TEST OFFER TO LISTED FIRMS: We make more than 50 types of gloves to fit different jobs. Describe your operation, materials handled and temperature condition. We will supply samples of the correct glove for on-the-job testing. Edmont Manufacturing Company, 1212 Walnut Street, Coshocton, Ohio. In Canada write MSA, Toronto.

Edmont JOB-FITTED GLOVES

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# POWELL
## CORROSION-RESISTANT
# VALVES

**Performance makes the world of difference**

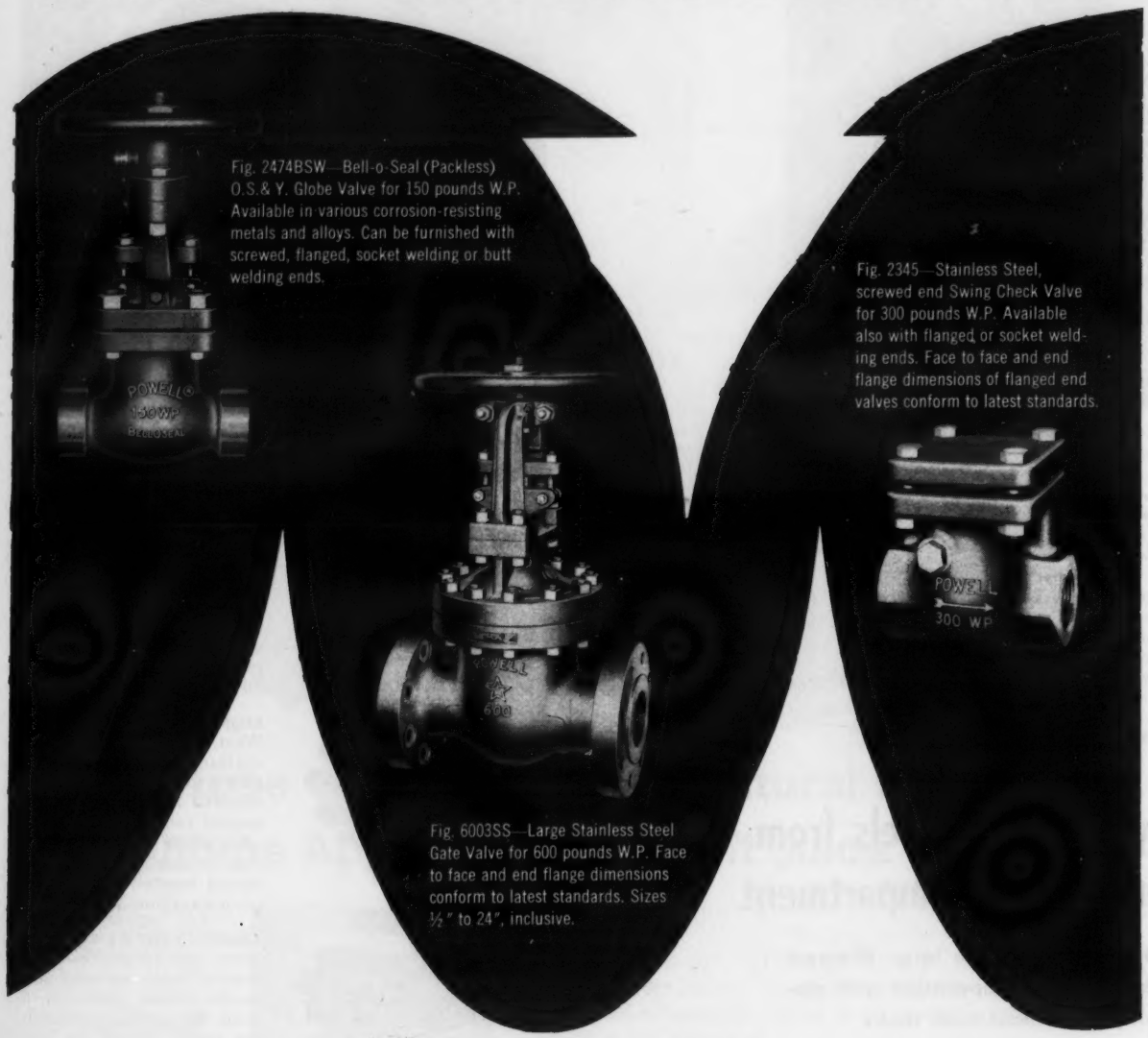


Fig. 2474BSW—Bell-o-Seal (Packless) O.S.& Y. Globe Valve for 150 pounds W.P. Available in various corrosion-resisting metals and alloys. Can be furnished with screwed, flanged, socket welding or butt welding ends.

Fig. 2345—Stainless Steel, screwed end Swing Check Valve for 300 pounds W.P. Available also with flanged or socket welding ends. Face to face and end flange dimensions of flanged end valves conform to latest standards.

Fig. 6003SS—Large Stainless Steel Gate Valve for 600 pounds W.P. Face to face and end flange dimensions conform to latest standards. Sizes ½" to 24", inclusive.

Powell pure metal and special alloy valves have long been recognized by the Chemical and Process Industries as leaders in the field of corrosion-resistant flow control equipment.

The result of painstaking research; years of experience in modern foundry practice, pattern limitations, and machining possibilities, Powell Corrosion-Resistant valves can be depended upon for long uninterrupted service, with little or no maintenance, and freedom from contamination of end product.

They are available in a wide selection of materials ranging from "A" to "Z" (Aluminum to Zirconium) to handle practically every known corrosive media. For complete details contact your nearby Powell Valve Distributor—or write directly to us.

**Powell . . . world's largest family of valves**

THE WM. POWELL COMPANY • DEPENDABLE VALVES SINCE 1846 • CINCINNATI 22, OHIO

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First week of operation with the label extractor was scheduled for 100 hours. Daily observations of quantity of paper discharged indicated that total daily discharge did not vary more than a few pounds from one day to the other.

At the end of the week of operation, drain cock from the second compartment was opened. There was a rush of free-flowing caustic to the open drain. Only a few stray labels appeared, together with a bit of muddy pulp.

When it was safe to open the manhole, it was found there was only a thin film of muddy pulp left behind, plus a few fragments of broken glass.

Residual material was weighed and found to amount to only 30 pounds. During each 20-hour operating day of the entire 5-day week, more than 300 pounds of pulp had been continuously removed by the unit. Production records showed that over 1½ million bottles had passed through the soaker in the 100-hour period.

**Operation with several tanks:** Unit may also be used in conjunction with several dormant soak tanks.

A manifolded hookup to a single label extractor will remove labels from at least four and possibly five tanks, if unit is continually run while bottle washer is in operation and tanks are recirculated alternately.

Operation is programmed so that solution is drawn from tank No. 1 and circulated through the label extraction unit for one hour. The operation is then switched to tank No. 2, then to tank No. 3 and finally to tank No. 4.

After each tank has received its one hour process of solution screening and label extraction, unit is again switched to tank No. 1 and procedure is repeated.

In actual field tests, the hourly switch-over procedure was adhered to for one 80-hour week. Solution was then drained from all dormant soaking tanks.

All remaining label residue

found at bottom of tanks was weighed and found to be a very small percentage of label accumulation normally encountered.

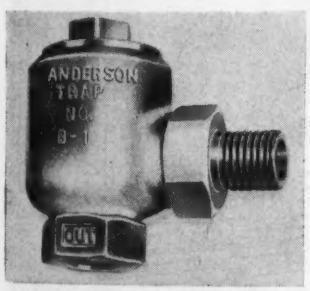
Soaker tanks were then recharged and permitted to operate two weeks prior to cleaning. After two-week test period, it was found that actual label residue accumulated in tanks had not been increased, and did not exceed the accumulation recorded for previously recorded one week's run.

(Causti-Clean label extraction unit is a development of Barry-Wehmiller Machinery Co., 4660 W. Florissant Ave., St. Louis 15, Mo.)
7200 on Reader Service Slip.

### Thermostatic steam trap features built-in union

Thermostatic steam trap with built-in union reduces both initial cost of trap installation as well as maintenance. Designed into inlet of trap, union eliminates time involved in fitting pipe to a union, as well as cost of purchasing a separate union and materials.

Maintenance is greatly simplified since trap can be disconnected by loosening a single fitting. Built-in union feature

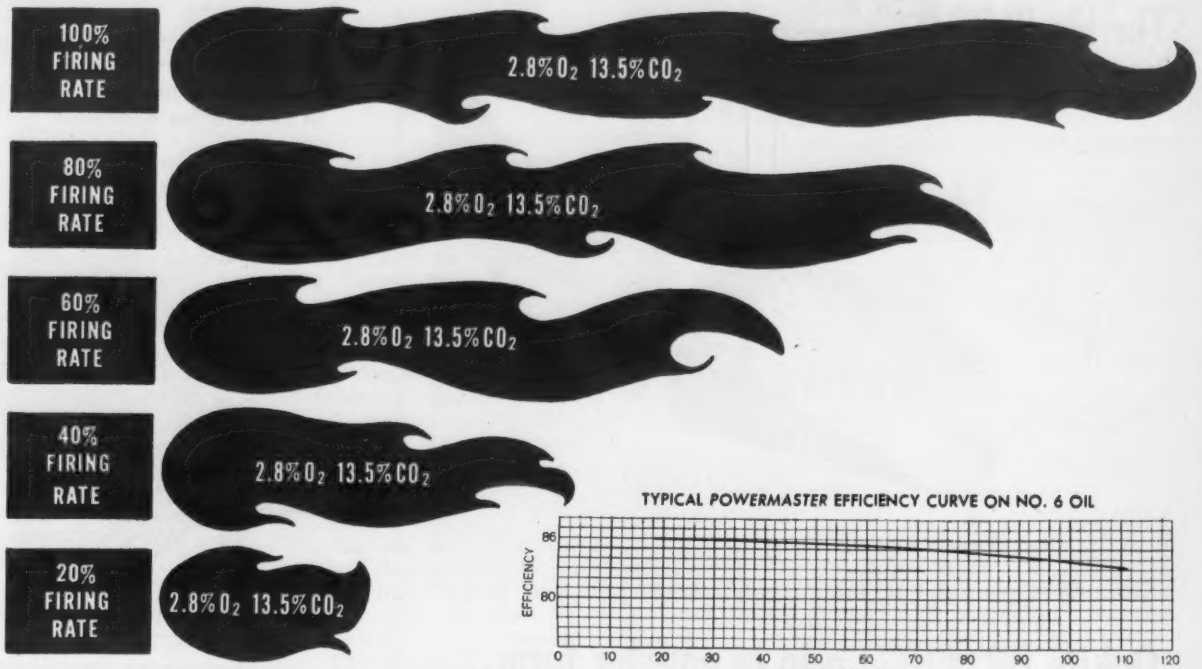


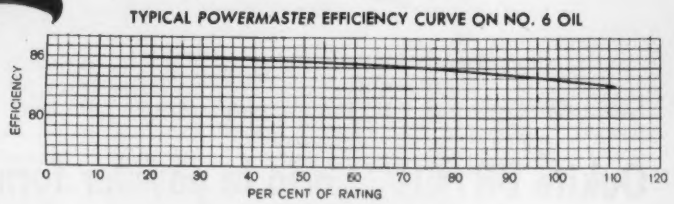

Thermostatic steam trap has built-in union at inlet

is optional on line of steam traps in both ½" and ¾" sizes.

(Quick-Flex Thermostatic Steam Traps with built-in union are a product of The V. D. Anderson Company, Div. of International Basic Economy Corporation, 1935 W. 96th St., Cleveland 2, O.)
7201 on Reader Service Slip.

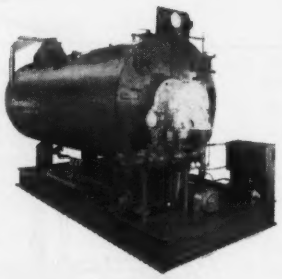
FROM THE WORLD LEADER IN PACKAGED AUTOMATIC BOILERS AND BURNERS




**Only Powermaster® gives you this type efficiency**

**Constant fuel-air ratio assures maximum efficiency at any load . . . cuts operating costs . . . returns investment faster**



Whether you operate a *Powermaster* boiler from a low of 20% to a high of 100% of capacity, you get the same high constant efficiency. With O&S exclusive 5 to 1 turndown, fuel-air ratio is maintained at all loads with the same low percentage of excess air (2.8% $O_2$) and high percentage of $CO_2$ (13.5%).

This constant efficiency is important to you for three reasons: 1. Lower operating costs; 2. faster return on your investment; 3. more uniform heating, more uniform process and improved product quality.

Whether your requirements are for comfort heating, process or power, you'll pay for your boiler investment faster with an O&S *Powermaster*. For information on all *Powermaster* benefits, call your nearest O&S representative or write for Bulletin 1260.

75th Anniversary

**ORR & SEMBOWER, INC.**
820 Morgantown Road
Reading, Pa. • Since 1885

Powermaster®
PACKAGED AUTOMATIC BOILERS

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## The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

# Oakite DRYCID...acid in powder form... descales with safety and convenience

Oakite DRYCID, acid descalant in concentrated powder form, is far safer to use... much easier to handle than liquid acids. SAFER because potential danger of bottle breakage, liquid spillage and acid fumes is avoided. EASIER TO HANDLE because DRYCID comes in disposable containers. There are no heavy carboys to shift or store. No carboys to return. No costly book-keeping procedures.

Oakite DRYCID is safe for equipment, too. Inhibited, it won't injure steel or copper; neither will it hurt aluminum, brass or galvanized surfaces. DRYCID is particularly useful for removing scale and rust from such equipment as air conditioning units, heat exchangers, dough mixers, refrigeration equipment. For removing milkstone from H. T. S. T. pasteurizers, homogenizers, evaporators.

**The BIG Plus in Oakite**

Working with Oakite is like adding a competent cleaning engineer to your staff. It brings the results of lasting research in cleaning and sanitation... an end to waste of time and materials... mechanization of tedious jobs... a wealth of experience... unsurpassed materials *guaranteed* to do the job.

Write for Bulletin B-6564. Better still send for your local Oakite man. Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

Export Division Cable Address: Oakite

OAKITE

over 50 Est. 1909 SCIENCE years' leadership in industrial cleaning

Technical Service Representatives in Principal Cities of U. S. and Canada

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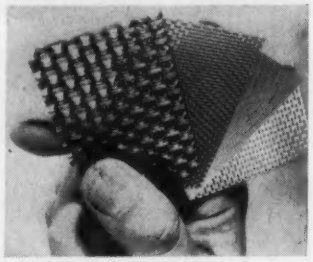
### Tripples screen life, increases throughput in dewatering operation

Pierced metal sheet for screening, recovering or dewatering food products lasts up to three times longer than perforated metal and increases throughput efficiency.

Screen is made from sheets of carbon steel, stainless steel, copper, brass or aluminum pierced with trapezoidal holes. Thickness of sheet can be up to seven times hole diameter.



Perforated metal sheet for screening, recovering or dewatering applications is available in carbon steel, stainless steel, copper, brass or aluminum

Hole diameters range from 0.004 to 0.009 inches and sheet thicknesses range from 0.014 to 0.079 inches.

The working side of the sheet, which has the smaller end of the tapered holes, has humps that act in shovel-like fashion to guide material to the openings to increase throughput. This shovel-like action also extends life of screen and provides freedom from clogging.

Working side of the sheet is available in several degrees of smoothness, from unrolled to rolled flat with electrolytic polish. Finish selection and hole size depends upon application.

Pierced metal is available in sheets up to 31 inches wide or formed into sheared shapes, cones, segments and cylinders. It can be tensioned and made with clamping grooves or turned edges.

(Conidure pierced metal sheets for screening, recoveringor dewatering applications is a product of Cross Perforated Metals, National-Standard Company, Carbondale, Pennsylvania.)

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"Fred, did you find the leak yet . . . Fred . . . Fred . . ."

Here's the answer to your wash-up problem—

Hot and Cold Water
Steam and Cold Water

Consult your dealer or write for complete catalogue and specifications

STRAHMAN VALVES, Inc. NICOLET AVE. FLORHAM PARK, NEW JERSEY

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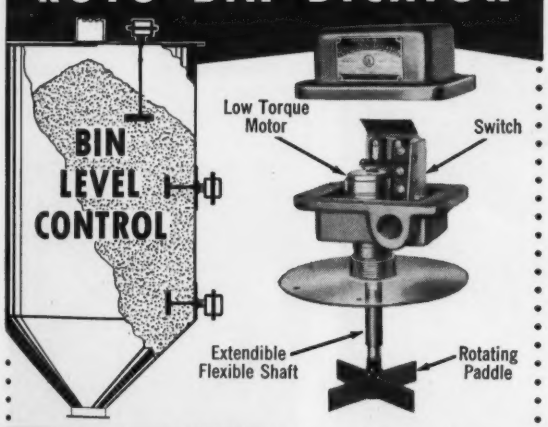
ROTO-BIN-DICATOR




HIGH IN PERFORMANCE -All Models Heavy Duty
LOW IN COST -Most Popular Model $55.00
FIRST IN SALES -Since 1957

Underwriters' Laboratories Listed
General Purpose and Explosion-proof Models

Product of
THE BIN-DICATOR CO.
13946-C Kercheval, Detroit 15, Mich.

Write for detailed literature or phone VAlley 2-6952

WE SELL DIRECT • PHONE ORDERS COLLECT

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### SS drums: where to use them, how to clean them

Applications and maintenance of stainless steel shipping and processing drums are subjects of 12-page booklet.

Literature defines stainless steel and presents its advantages. Various types of drums are discussed and their features of construction illustrated. Uses for different models are suggested.

Publication contains eight helpful pointers and five "Don'ts" on the care and cleaning of drums. It also includes specifications and ordering instructions.

("The Use and Care of Stainless Steel Drums," Booklet, is available from Inland Steel Container Co., Division of Inland Steel, 6532 S. Menard Ave., Chicago 38, Ill.)
7207 on Reader Service Slip.

### Lists corrosion resistance to 390 different fluids

Eight-page guide is a tabulation of relative ability of metals, plastics and synthetic rubbers used in ball valves to resist corrosion.

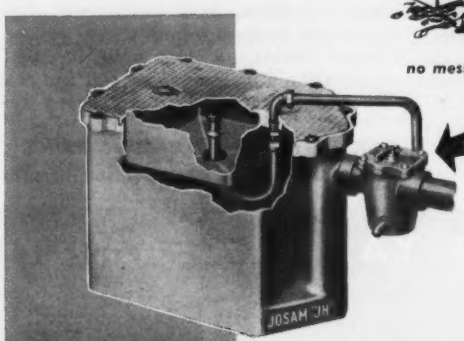
Charts are keyed to show relative immunity to 390 different fluids, among them alcohols, fatty acids, beer, beet-sugar liquid, brine, buttermilk, coffee, ethyl alcohol, fish oils, fruit juices, gelatin, glucose, ketchup, mayonnaise, methyl alcohol, milk, molasses, soybean oil, starch, vinegar, whiskey and wine.

Introduction presents cross-sectional diagram of ball valves and lists chemical composition of metals—aluminum, carbon steel, semi-steel and 316 SS—used in their construction.

Physical characteristics and temperature range of non-metallic materials used in valves, Buna-"N", neoprene, Viton A, Teflon, nylon and Kel-F, are also included.

("Corrosion Resistance Rating Guide for Flo-Ball Valves" may be obtained by writing Hydromatics, Inc., 70 Okner Parkway, Livingston, N.J.)
7208 on Reader Service Slip.


intercepts grease and discharges it at the turn of a valve...




Josam series "JH" GREASE INTERCEPTOR

Why put up with old fashioned type of grease interceptors which must be emptied by hand when you can have a device which is simple, sanitary and efficient in operation?

The Josam Series "JH" Grease Interceptor not only intercepts over 95% of the grease in waste water and prevents the grease from clogging drain lines . . . but it draws off the collected grease AT THE TURN OF A VALVE! An interceptor that does not do this requires extra labor cost every time it needs to be cleaned. Insist on the Josam Series "JH" Grease Interceptor — get complete details by sending coupon below.

JOSAM MANUFACTURING CO.
General Offices and Manufacturing Division
Michigan City, Indiana

Josam Manufacturing Co.
Dept. FP-5, Michigan City, Indiana
Please send Manual W on Interceptors

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By .....
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City ..... Zone..... State .....

7209 on Reader Service Slip.

# SERIES 40 GOBBLES UP EXTRA HEAVY CONDENSATE LOADS

This "thirsty" Yarway Impulse Steam Trap gives you all the well-known Yarway advantages like *quick heat-up, even temperatures, small size, good for all pressures, non-freezing*—PLUS the added feature of *huge capacity*.

For example, at 100 psig the ¾" size will handle 5600 lbs/hr; the 2½" size, 62,000 lbs/hr.

Specify the Yarway Series 40 Trap for applications on large autoclaves, cooking kettles, heat exchangers, heating coils and other places where loads are heavy.

Buy the Yarway Series 40 from your nearby Industrial Distributor—more than 270 stock and sell the Yarway line. Over 1,250,000 Yarway Impulse Steam Traps already sold.

**YARNALL-WARING COMPANY**
100 Mermaid Ave., Philadelphia 18, Pa.

**SERIES 60**—normal needs, pressures to 400 psi, 6 sizes. **SERIES 120**—normal needs, pressures to 600 psi, 6 sizes. **SERIES 40**—for extra heavy loads, 5 sizes. **NO. 30**—for extra light loads (½" only). **INTEGRAL STRAINER**—highest pressures and marine use, 6 sizes.

YARWAY | *impulse® steam traps*

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### Soaks up oils, grease, chemicals from floors

Specially processed sanitary mineral clay is used to absorb oil and grease from floors.

Spread on wood, metal or concrete floors, just ⅛" thick, it absorbs soluble oil, lubricating oil, grease, acids and chemicals.

Compound, processed in granular form, stays on floor until saturated and is then easily swept off.

(Free sample of Oil Spunj sanitary mineral clay is available from Canfield Oil Co., 3216-20 E. 55th St., Cleveland 27, Ohio.)
7211 on Reader Service Slip.

### Automatically winds, stores hose overhead

**Reels provide sanitary, safe storage**

**Problem:** When new departments are planned and built, adequate hose facilities for clean up are often an afterthought. Consequently, hose is coiled on floor where trucks damage it or it is coiled on hooks thus inducing kinks.

**Solution:** At Peter Eckrich & Sons, meat packers in Ft. Wayne, Indiana, due consideration was given to hose storage while new departments were still in planning stage, and it was decided to test spring-retractable reels.

Clean-up hose is stored overhead, handles water at pressure of 75 psi and temperatures from 55 to 155 F

To handle the over 400 ft of ½-in. ID (1-in. OD) hose, reels are located at seven sta-

tions. Each reel handles 60 ft of hose and is ceiling mounted. Overhead mounting is particularly desirable since firm uses lift trucks in new processing areas.

**Results:** After a year of operation, Mr. Del Proctor, Plant Engineer, reports that hose handling time has been practically cut to nil by automatic rewinding.

With hose stored overhead when not in use, safety and sanitary conditions are improved and hose wear and damage has been greatly reduced.

Reels have required no maintenance work for over year of full operation.

(Hose Reels are made by Clifford B. Hannay & Sons, Inc., 4900 E. Main St., Westerlo, New York.)
7212 on Reader Service Slip.

### Seepage-proof steel plate floor

**Uses:** For areas in dairy and other food plants where flooring capable of withstanding heavy wear and abrasion is needed.

Easily cleanable steel-plate floor is used here to prevent excessive wear from heavy traffic on loading dock

**Features:** Adhesive which holds plates to concrete also seals joints against seepage. Therefore corrosion of underlying concrete by lactic or most other acids and weak alkalis is prevented.

**Description:** Flooring system consists of 12 by 12 in. diamond-surfaced steel plates joined to concrete floor and

A Y Globe that challenges comparison shows it pays to

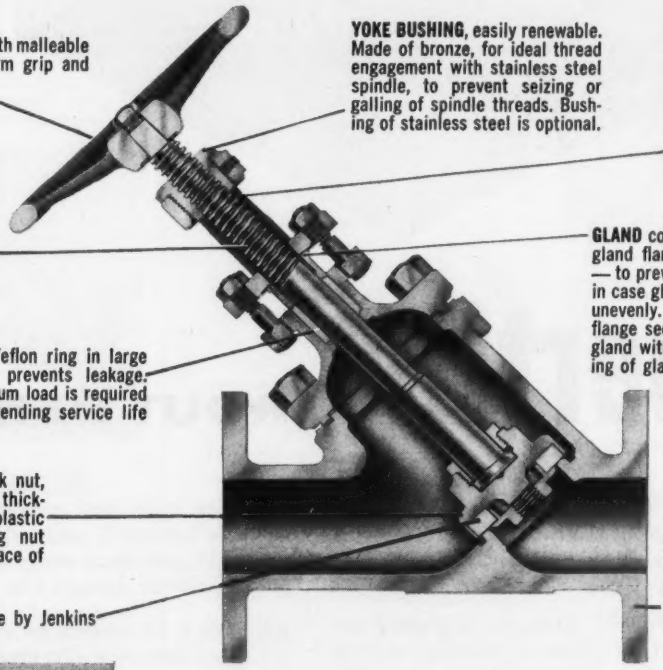
# Specify JENKINS for STAINLESS STEEL Valves, too

Want the "best buy" in Stainless Steel Y Globe Valves? Compare this Jenkins Fig. 1335 with any on the market. You'll conclude that it's hard to beat Jenkins at making valves, no matter what the material.

You'll find genuine superiority of design and construction in the features shown here. But no picture can show the quality of the castings . . . the precision machining . . . the rigid inspection and testing that have gone into this valve. All of these are as important as design and metal alloys in assuring long, dependable, economical valve service. And, all of them are up to the peak standards for which Jenkins has been known for almost a century.

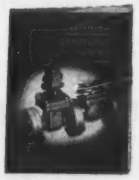
SEND FOR NEW CATALOG of Jenkins Stainless Steel Valves, in patterns and alloys that satisfy the requirements of practically all corrosive services.

These Jenkins Valves meet valve industry specifications and the high standards established by leading users of stainless steel valves.


WHEEL of high strength malleable iron designed for firm grip and easy operation.
YOKE BUSHING, easily renewable. Made of bronze, for ideal thread engagement with stainless steel spindle, to prevent seizing or galling of spindle threads. Bushing of stainless steel is optional.
YOKE BONNET, a single unit, has liberal space between yoke arms for easy access to packing box. Tongue and groove joint with body makes a pressure-tight seal with less tightening on the bolts, and eliminates possibility of blowing out the Teflon gasket.
SPINDLE of large diameter and dense structure has high resistance to wear and torsion strains. Easy, tight closing is assured by long, precision machined thread bearing surfaces. A beveled shoulder provides backseating against inside of bonnet, permitting repacking under pressure.
GLAND consists of two pieces — gland flange and gland follower — to prevent binding of follower in case gland bolts are tightened unevenly. Crowned surface of flange secures tightness against gland without excessive tightening of gland nuts.
PACKING A Teflon ring in large packing box prevents leakage. Only a minimum load is required on gland, extending service life of packing.
DISC HOLDER, held by lock nut, has depth equal to disc thickness, preventing flow of plastic disc. Wide disc retaining nut covers all but seating surface of Teflon disc.
DISC is Teflon made by Jenkins
BODY Through-port design for full, free flow. Liberal seat height permits repeated refacing. Cast on body are directional arrow and bosses for drain connections. End flanges conform to M.S.S. specifications.

JENKINS
LOOK FOR THE JENKINS DIAMOND
VALVES

Sold Through Leading Distributors Everywhere



JENKINS BROS., 100 Park Avenue, New York 17, N. Y.

☐ Send the new stainless steel valve catalog

☐ Have a representative call on me

NAME & TITLE.....

COMPANY.....

ADDRESS.....

7213 on Reader Service Slip.

to each other with epoxy resin adhesive.

(For complete information on flooring system, write Ralph V. Rulon, Inc., 3900 N. Second St., Philadelphia 40, Pa.)
7215 on Reader Service Slip.

### Eliminate odors electrostatically

Electric blower in deodorizer circulates air through unit and electronic system "burns" odors. No filters or chemicals are required.

Unit is portable; it weighs only 20 lb. Heavy-duty industrial model will handle odors in room of approximately 20 by 20 ft.

Further details on deodorizer are described in two-page bulletin which illustrates unit and lists its specifications.

("Morris Electrostatic Deodorizer," Technical Bulletin No. A-60, may be obtained by writing Morris Deodorizers, Incorporated, 2819 Broadway, NE, Knoxville 17, Tenn.)
7216 on Reader Service Slip.

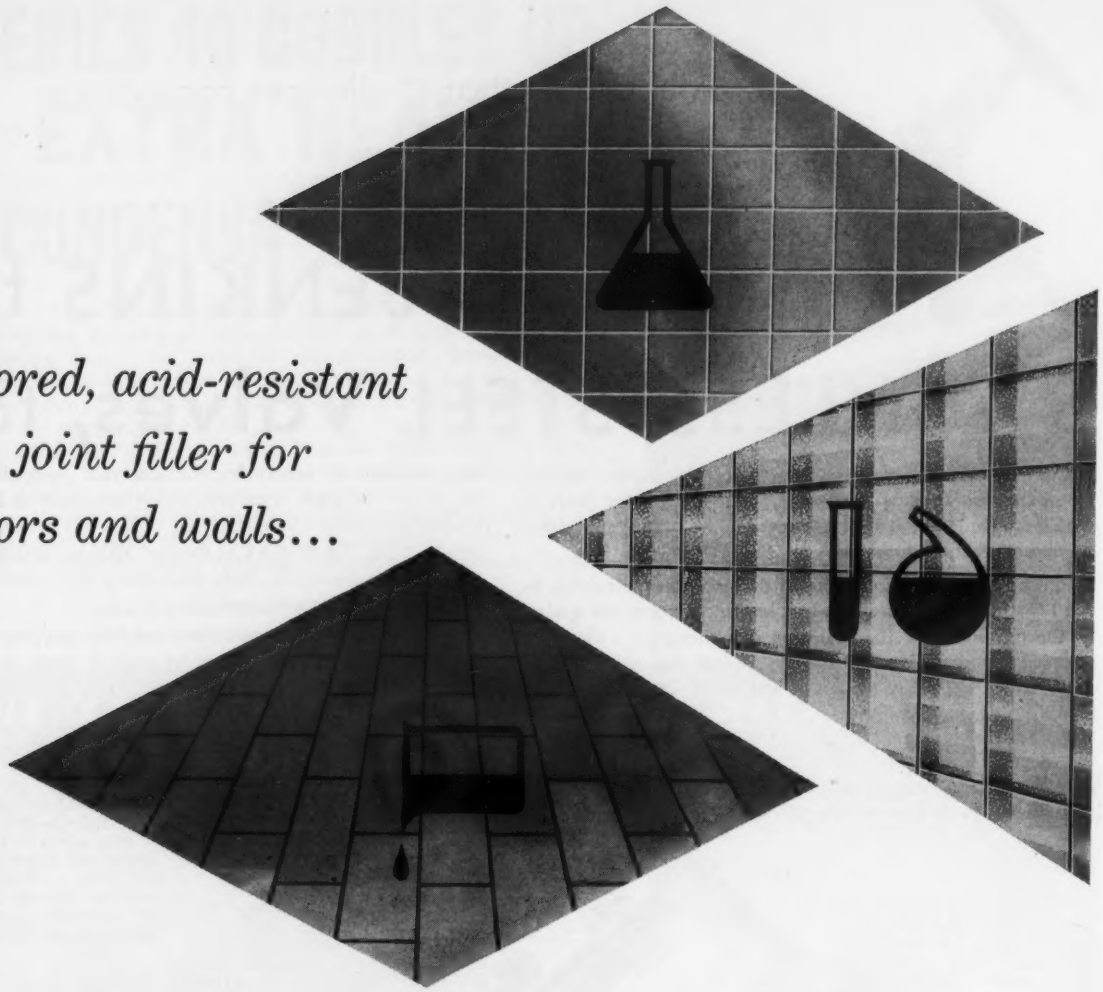
### Cuts paint drying time to less than 30 minutes

Paints are formulated to air-dry to touch in less than 30 minutes. They are made in nine colors and can be applied by spray gun, brush or by dipping.

Fast-drying coating system, as well as heat-resistant, water-resistant and heavy-duty chemical resistant systems are described in 38-page catalog. Specific applications for each system of paints are discussed and illustrated, and color guides are included.

There is a section on mixing and thinning and another section covers technical data such as application techniques and estimating sq ft coverage of different shapes.

("New Color Horizons," Form No. 259, may be obtained by writing Rust-Oleum Corporation, 2799 Oakton St., Evanston, Ill.)
7217 on Reader Service Slip.

*Colored, acid-resistant joint filler for floors and walls...*

# Supertite GROUT CEMENT

Supertite Grout Cement is a mortar type acid-alkali resistant grout cement that literally welds brick, tile or glass block together, resulting in a perfect, permanent floor or wall.

Supertite is immune to attack by food acids and will easily withstand cleaning solutions, organic chemicals and water. It is easily cleaned and sanitary and will not deteriorate with age. Supertite is permanent as the tile itself.

Supertite is an ideal cement for both new and old jobs because it sets quickly and bonds permanently, yet cleans easily before setting...will not discolor or damage tile.

Add years of service to walls and floors and eliminate contamination problems with Supertite ...available in three attractive colors.

*For information write:*

Nukem **NUKEM PRODUCTS CORP.**
Dept. 4E • 111 Colgate • Buffalo, N.Y.
*A Subsidiary of Amercoat Corp.*

N101

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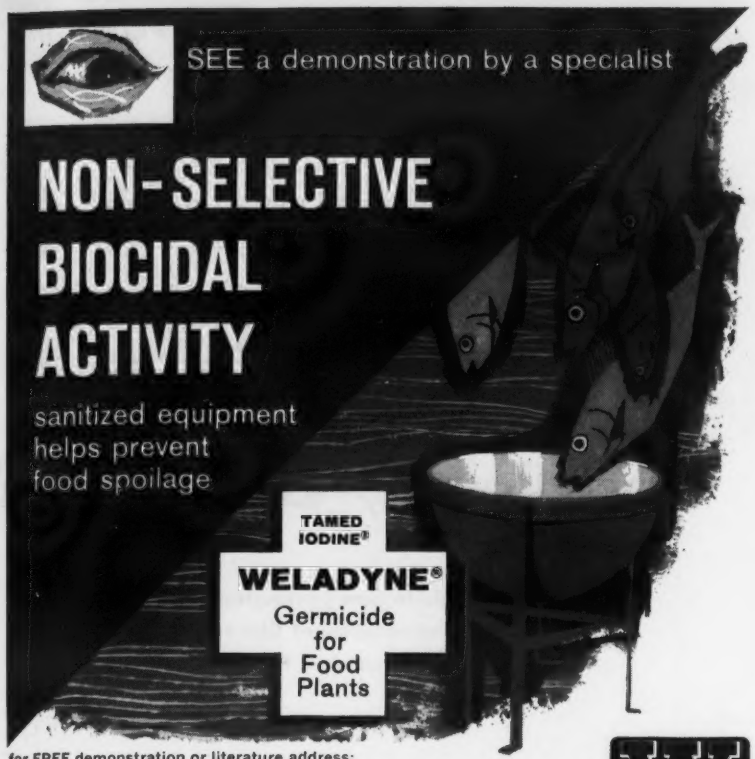
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NON-SELECTIVE BIOCIDAL ACTIVITY
sanitized equipment helps prevent food spoilage
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MOSQUITOES
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CONTACT

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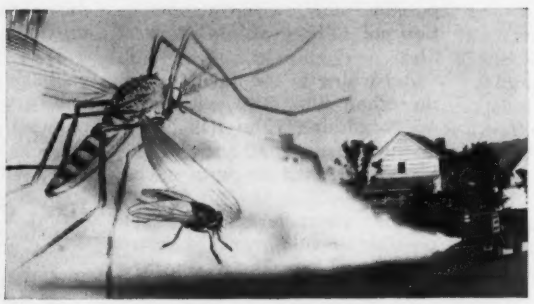

## TODD INSECTICIDAL FOG APPLICATOR
## Available for Operation on Propane or Gasoline

Lowest-Cost Space Control throughout the community. Peak performance against all insect pests . . . on the dump, over pools, in suburbs, play areas, everywhere insects swarm. Best by test for over 15 years, TIFA sets the records for lowest operating and maintenance costs in 5000 communities throughout the world. True clean fog with maximum efficiency . . . one man operation. New Starter-generator (optional) for immediate starts. Easily attached to new and existing TIFA units.

*Carrying Underwriters' Listing Seal MH 4162*
*Write for illustrated folder with details and official comments.*

**TODD SHIPYARDS CORPORATION**
**PRODUCTS DIVISION**
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Plant, Sales and Service: Green's Bayou, Houston 15, Texas
*Sales and Service Agencies throughout the Western Hemisphere*

7219 on Reader Service Slip.


### Control offensive odors

Air sanitizer preparation is said to control offensive odors without masking or replacing one odor with another.

Preparation is simply sprayed in area desired. According to manufacturer molecules of air sanitizer then combine with odor molecules, forming odorless compounds.

While preparation contains no formalin-phenolic resins or floral perfumes, it does have a faint citrus fragrance. This serves to identify space which has been treated.

Manufacturer states that an added advantage for food processors is that preparation is also antiseptic, serving to reduce microbial population in treated areas.

Air sanitizer is available in concentrate or in individual aerosol spray cans.

(Turgasept air sanitizer is a product of Turgasept Co., 505 Fifth Ave., New York 17, New York.)
7220 on Reader Service Slip.

### Prevents seizing while lubricating

Line of anti-seizing and lubricating compounds consists of three different products for different applications.

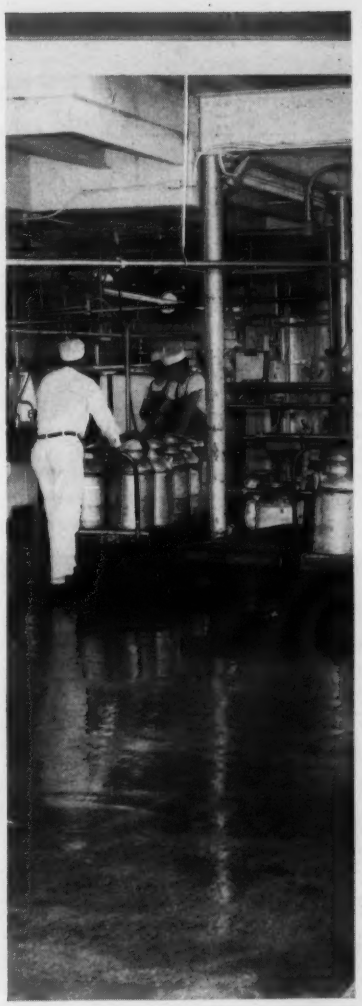
High-purity compound is recommended, according to manufacturer, for threaded parts where prevention of product contamination is essential.

For use on titanium, SS, aluminum and high-temperature alloys at operating temperatures up to 400 F, material is impervious to moisture and thermal stresses.

Second product is formulated for same uses as first. It is impervious to water washout and most acids.

Third compound is for applications at temperatures up to 2100 F.

(High Purity Goop, Blue Goop and Silver Goop are products of Crawford Fitting Company, 884 140th St., Cleveland 10, Ohio.)
7221 on Reader Service Slip.

**MONILE COPOLYMERIZED FLOORS resist spalling and crumbling under heavy trucking... hard shock... severe vibration... resist destructive acids, alkalies and salts ... resist damage from soaking of oil, grease and water.**

MONILE bonds to concrete with 39 times more adhesion than concrete to concrete...has 3 times the flexural strength...twice the compressive strength and 3 times the tensile strength of concrete. Monile is applied ½" thick over old or new wood, concrete, brick or tile floors. See Sweets Plant Engineering File 4f/Ma or write for 8-page brochure. The Master Mechanics Co., Cleveland 28, Ohio, or The Master Mechanics Chemicals Co., (Canada) Ltd., Toronto 14, Ontario, Canada.

THE MASTER MECHANICS COMPANY

7222 on Reader Service Slip.

Poultry was a "natural" first product market for "Type L," because of the film's high clarity and gloss and its amazing ability to shrink tightly for a contour fit

**Irradiation proves 'fairy godmother' for making plain polyethylene into a 'Cinderella'-type**

# Shrink-on, 'breathing' poly

**Opens up whole new packaging concept that uses shrink-energy of film to literally wrap itself around food products**

More than five million frankfurter packages, using "Type L" film, now are reaching the market shelves each month. Film is printed the same as regular poly, in up to four colors

For produce, protective, transparent sleeve of "Type L" film holds items tightly in place on base tray, yet allows for ample air circulation

Shrink-on "contour packaging" of meats, poultry, baked foods, confectionery products, fruits and vegetables in plentiful, low-cost polyethylene is possible now, with introduction of "Type L" Cryovac film.

According to the developers, no other film, and certainly no "breathing" film has been manufactured that shrinks to such an extent or with such energy.

This characteristic makes possible development of new high-speed packaging techniques that use the "shrink energy" of the film to do much of the wrapping and sealing of the package.

Through controlled hot-air shrink techniques, for example, the film can be made to shrink itself tightly around the tops of baking pans, produce trays and even stalks of celery.

Essentially, the new film offers these three entirely new packaging concepts:

1) a shrink-on cover, such as a skin-tight cover over baked foods sold in aluminum trays. No seal is needed — cover merely shrinks on as a tight lid over lip of tray (see diagram).

2) a shrink-sleeve package for fruits and vegetables. Film slips on as a sleeve over a cardboard tray of fruit. The sleeve is open on both ends, and is sealed as the tray moves through a sealer-cooler unit.

3) a twist-tie package for cabbage or lettuce. Package ends are twisted, then package passes through a hot-air shrink tunnel. The package becomes tight without a heat seal.

**Key processing step** in transforming plain polyethylene film into unique "Type L" film is irradiation.

In the manufacturing process, top-grade polyethylene is extruded in a thick web known as a "tape." This is passed under the eye of a two-million-volt General Electric electron-beam generator.

As the electrons hit the tape, the high-energy source causes the heretofore linear polyethylene molecule to become unstable, and therefore, reactive with other molecules—increasing film strength sufficiently to make it possible to stretch the material *in both directions* more than 200 per cent from original size.

The stretching process, known as biaxial orientation, imparts to the film its tremendous shrink energy.

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# polyethylene film

**NORB LEINEN**
Associate Editor

When exposed to hot air or hot water at 180 F, the film immediately shrinks, by 20 per cent, and will *continue to shrink equally in all directions* as the temperature is increased until film returns to its original size.

This shrink-tight fit, combined with the exceptional clarity and gloss imparted in the stretching process and the film's unusual strength (eight times that of conventional polyethylene) makes for packages that ship well without breakage and display well regardless of temperature or humidity conditions.

**From the radiation standpoint,** the film is as inert after it leaves the generator beam as it was before irradiation, since the equipment used produces far too low an electron voltage to make any substance — including polyethylene — radioactive in itself.

As with other polyethylene films, there is no problem under the Additives Law with use of "Type L" film. (Effective date of the Additives Law has been extended for one yr for polyethylene. Apparently, its use as a film has been cleared, and the additional time is needed for consideration of use of polyethylene as a resin in coating formulations.)

Simple hand-wrapping machinery, commercially available, will handle the film. In addition, there reportedly are at least six automatic wrapping machines that can be used.

However, the latter must be modified by addition of a cold plate immediately after the sealing unit, to cool the seal. This in turn is followed by a shrink tunnel.

These automatic wrapper adaptations (shrink tunnel and cold surface) cost $500 to $3500 — depending on the complexity of the unit.

Currently, film manufacturer's equipment-design engineers are developing entirely new semi-automatic and automatic wrapping equipment that will take full advantage of the film's unusual characteristics.

**Competitive cost.** In the course of test marketing, more than a million lb of CRYOVAC Type L film have been sold at a price of 3c per 1000 sq in.

This cost is less than Saran and compares favorably with other packaging films for similar applications — including regular polyethylene (1.9 to 2.6 cents per 1000 sq in.) and cellophane (2.7 to 3.3 cents).

Company currently is producing at rate of more than a million lb of Type L film per year in thicknesses from one to 1.3 mil, but has capacity for more than double this volume and is adding more. (Test quantities are being produced in thicknesses as low as .5 mil.)

In addition, manufacturer is investigating the process for use with other type films, since original patents cover all polyolefins, including high- and low-density polyethylene, polypropylene and various copolymers.

These packaging machines currently will handle "Type L" Cryovac film (with necessary attachments), for packaging of frankfurters only:

"Wrap-King" models "M", "F" and P2, manufactured by Crompton & Knowles Packaging Corp., 93 Grand, Worcester, Mass.

Model 43L, manufactured by Hayssen Manufacturing Co., 13th & St. Clair, Sheboygan, Wisconsin.

Corley-Miller Handwrap and Automatic Frankfurter Machines, manufactured by Miller Wrapping and Sealing Machine Co., 12 S. Clinton St., Chicago, Ill.

These packaging machines currently are under test for use with "Type L" Cryovac film:

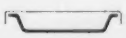
Carton Overwrap F.A.2, for candy and other items packaged in rigid trays, manufactured by Oliver Machinery Co., 450 Sixth St., N.W., Grand Rapids 2, Mich.

Carton Overwrap, for candy and other items packaged in rigid trays, manufactured by Hayssen Manufacturing Co., 13th & St. Clair, Sheboygan, Wisconsin.

Hudson-Sharp Campbell Wrapper, for pouch-packaged foods such as cheese, manufactured by Food Machinery & Chemical Corp., FMC Packaging Machinery Div., 4900 Summerdale Ave., Philadelphia 24, Pennsylvania.

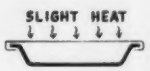
**For Tray-Packed Baked Foods . . .**

**. . . here are the key steps.**



**1** square of film is placed manually atop tray so that edge of film overlaps tray rim on all sections of the edge

**2** 180 F heat is applied automatically to underside of tray rim, causing overlapping portion of film to shrink tightly around rim of tray




**3** slight heat blast is applied automatically to top surface to secure a taut, smooth, wrinkle-free film cover

*"Type L" Cryovac film is development of Cryovac Division, W. R. Grace & Co., 3 Hanover Sq., New York 4, N.Y., which also makes some semi-automatic shrink-cover machines and now is developing fully automatic machines.*
7223 on Reader Service Slip.

**After Removal of Cover . . .**

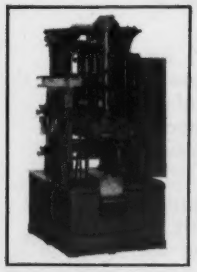
. . . elasticity of the film in the shrunken area under the rim makes the cover reclosable by merely "snapping" it back on.

# ELIMINATE YOUR SEPARATE LABELING OPERATION

## USE NEW HEADER LABEL ATTACHMENT

Only Hayssen compact gives you complete one step packaging from product processing to labeling. Now, the new Hayssen header labeler permits you to automatically label as you package, trimming your packaging labor requirements by at least two, helping you maintain high speed production and eliminating side trips to semi-automatic equipment.

*New Hayssen Header Label Attachments are now in use at Kroger Co., Dayton Nut, King Nut and Kar Nut packaging plants.*



**Only Hayssen Compak measures, forms, fills, seals and labels in one operation!**

- End sidetrips to semi-automatic header labelers, save cost of equipment, cut packaging labor requirements.
- Increase production speed — the Hayssen Compak Header label attachment is coordinated to the speed of the Compak to which it is attached. You label at the same high speed at which you package.
- Use roll stock — change labels quickly and easily for new packaging flexibility — attachment completely adjustable to label size. Labels can't curl, double feed.

**first in Automatic Packaging since 1910**

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7224 on Reader Service Slip.


*packaging*

### Stronger side seam opens new aerosol applications

Aerosol applications previously considered impossible because of pressure restrictions imposed on the propellant system selection may be possible with new "Tricom" solder aerosol can.

New system employs three-piece cans, as before, but replaces the conventional (and propellant limiting) two-component soldering system with a three-component one.

The can will be made in a full range of styles, and in sizes from three oz to 16 oz.

("Tricom" aerosol can is development of Continental Can Co., 100 E. 42nd St., New York 17, New York.)
7225 on Reader Service Slip.

## Oil-resistant ink extends use of polyethylene

Coconut oil-resistant ink system permits packaging of shredded coconut in polyethylene, after outside surface of film has been imprinted in up to five colors.

Packaging use is easily extended to coconut-covered

After normal storage, poly bag at top, printed with normal inks, shows appearance-marring tendency; lower bag, printed with COR-print ink, shows no ill effect

marshmallows and cookies, certain candies with a high percentage of oil and other food products containing a

(*Continued on page 90*)


## For continuous thru-put and inventory data—W-C CONVEYOR-SCALE SYSTEMS

With a W-C Conveyor-Scale System incorporated in your process scheme, you can have up-to-minute thru-put data at any point from incoming transfer to inventory stock-pile. This data, expressed in terms of weight per unit of time, can be totalized for inventory records, process programming, or other manufacturing and accounting functions.

W-C Conveyor-Scale Systems can be supplied for flat or trough-type belts, fixed or variable speed, in capacities from 20 to 1000 tons per hour for new or existing conveyor installations. Each is a job engineered system employing standard, unitized components. As a result, you get a "custom" system at an "off-the-shelf" cost.

**Typical applications include:** Controlling feed and blending of slag, limestone, caliche, rock, etc. to obtain required formulation.

Write for new Bulletin 60

W-C

WEIGHING & CONTROL COMPONENTS, INC.
Div. of CompuDyne Corp.
E. County Line Road • Hatboro 13, Pa.

7226 on Reader Service Slip.

*that's interesting*

### Gremlin's lament

Like all machines, high-speed packaging machines using film are vulnerable to malfunctions — usually the work of Gremlins — that interrupt smooth-running operations.

To see that this doesn't happen where its film is being used, Du Pont Co., like other film makers, spends considerable time and money overseeing these packaging operations. Du Pont says it has spent $500,000 and a year's work at three locations looking after the runability of a single variety of polymer-coated "K" cellophane.

### Can-opener's odyssey

Statistical gem of the month comes from American Can Co. which calculates that can openers travel more than 500,000 miles a year opening canned food for U.S. dinner tables.

For more information on product at right, circle 7227 see information request blank opposite last page.

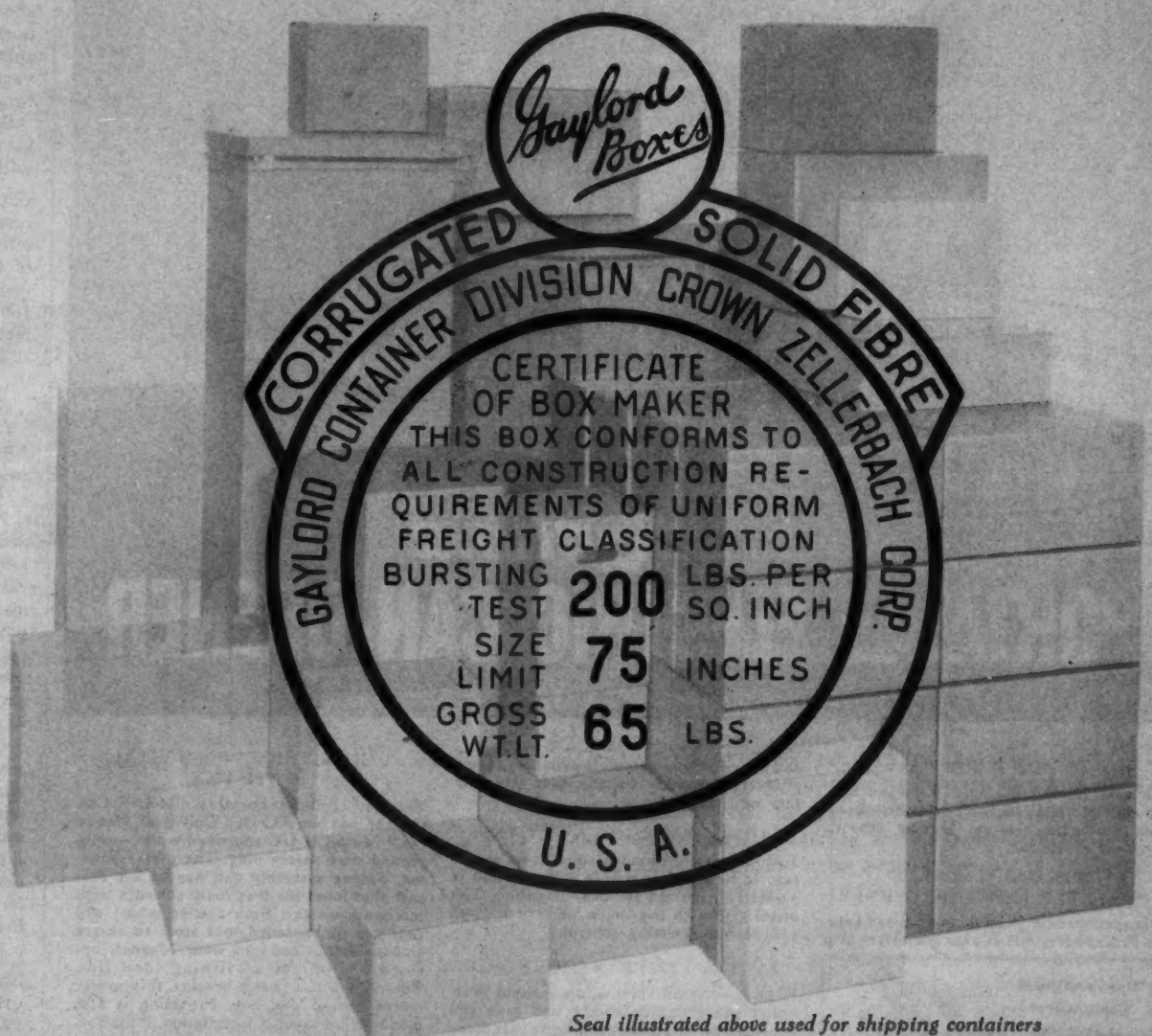

## *This is only one proof of* GAYLORD *quality*

Here you read the measurable qualities in Gaylord Containers.

But how do you measure experience and ingenuity . . . which are *extra* qualities built into every Gaylord box?

Gaylord is part of a completely-integrated, nation-wide organization of packaging talents, devoted to delivering the most efficient, most economical container you can buy.

Your nearby Gaylord Man can prove this. Why not let him try?




*Seal illustrated above used for shipping containers conforming to Uniform Freight Classification No. 41.*

**CROWN ZELLERBACH CORPORATION**
**GAYLORD CONTAINER DIVISION**

IN CANADA · CROWN ZELLERBACH CANADA, LTD. VANCOUVER, B. C.

HEADQUARTERS, ST. LOUIS
PLANTS COAST TO COAST

# HOW MANY CANS DO YOU OPEN A DAY?

DO A BETTER JOB FASTER

**The new Edlund Portable will open 500-750 cans per hour for you, depending upon your production set-up, leaving smooth edges on every can.**

THE ONLY *REALLY* PORTABLE ELECTRIC OPENER

**This opener requires no table-attached base. It's as maneuverable as your good right arm and operates with complete efficiency in any production set-up... single can, assembly line, or cans in the case.**

STOP MOVING HEAVY CANS!

**Just move the Edlund Electric from can to can. It weighs less than a #10 can and is perfectly balanced for easy handling. The pistol grip with trigger on/off switch gives you absolute cutting control.**

PAYS FOR ITSELF IN SHORT ORDER

**In large or small volume, the Edlund Portable's speed and durability will save you enough time and money to pay its cost many times over. It is simple to clean because you can really "get at" all cutting parts. It works as well on a sardine can as on a #10 can and, in actual kitchen tests, has opened hundreds of thousands of cans and still performs perfectly.**

CHECK THESE VERY VITAL STATISTICS

**The new Edlund Portable Electric Can Opener has an AC-DC Universal Heavy Duty Motor, is UL approved with 3-prong ground wire safety plug. The motor housing, opener assembly and handle are die-cast aluminum for maximum strength with minimum weight. Both cutting wheel and gear are of hardened tool steel to assure smooth cutting and long wear. Magnet (optional) eliminates "fishing" for lids. Equipped with hang-up bracket, this opener stores out of the way. Provision is also made for permanent installation, if desired.**

***Available from Edlund Dealers everywhere.***

Edlund
Burlington, Vermont

7228 on Reader Service Slip.


## packaging

(*Continued from page* 88)

high percentage of uncombined vegetable oils (which are compatible with polyethylene film and can dissolve into the film).

Formerly, oily products couldn't be packaged in poly because the oil emerged on the bag surface, causing ink on the surface to rub off on nearby packages or on customers' hands.

The new formulation ends this problem. Polyethylene bags decorated with this ink show no deterioration under normal storage conditions, in spite of high shortening or vegetable oil content of the product.

Special printing plates used in the system are compatible with the inks.

(COR-print(R) coconut oil-resistant ink system for polyethylene film is development of the Flexible Packaging Division of Continental Can Co., 100 E. 42nd St., New York 17, New York.)
7229 on Reader Service Slip.

### Packaging for sales and shipment

New approaches to the modern packaging problem of keeping pace with technological advances, new materials and expanding competition, while at the same time keeping packaging handling and shipping costs in line are presented by company executives in recently issued report.

Other papers review new methods of packing with pressure-sensitive tapes and expandable polystyrene, use of aluminum as a canmaking material and new uses for aerosol containers. More than 50 photos and drawings are included.

("Packaging for Sales and Shipment," based on material originally presented at AMA's 1959 National Packaging Conference in Chicago, is available at cost of $2.50 to AMA members, $3.75 to non-members, from American Management Assn., Inc., 1515 Broadway, New York 36, New York.

*that's interesting*

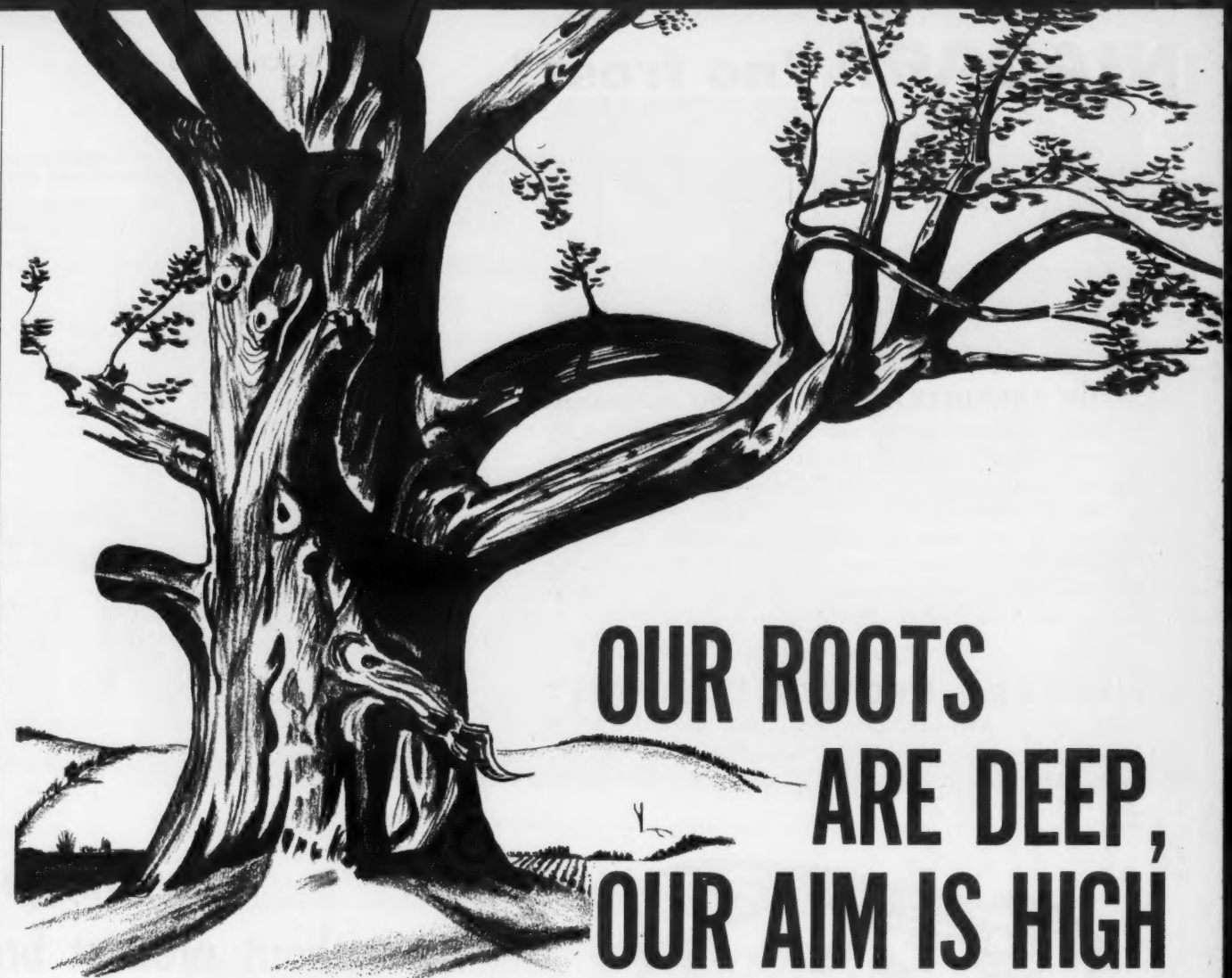
**King Pineapple now Prince?**

Now that pineapple-producing Hawaii is part of the family, it comes out that the new state has problems: its share of the world's pineapple market has slipped from 75 per cent to 57 per cent in the last 12 years.

This has happened, according to H. C. Cornuelle, president of Dole Hawaiian Pineapple Co., because competing producers in

Formosa, Malaya, Australia, South Africa and Puerto Rico pay lower wages, are taxed more moderately, enjoy lower freight rates and thus can undersell the Hawaiian pineapple by as much as 39¢ apiece in same markets.

For more information on product at right, circle 7230 see information request blank opposite last page.

# OUR ROOTS ARE DEEP, OUR AIM IS HIGH

## but Valves don't grow on trees

Some fifteen years ago, the aerosol industry was born. Shortly after, the Precision Valve Corporation began. As the industry grew, Precision did too, in research, in discovery, in development.

Today, with over 500 employees and more than 60,000 square feet of manufacturing space devoted to over 10,000 different combinations of specifications for aerosol valves, Precision works with the industry to create and develop new aerosol designs to improve current procedures.

Now, on the threshold of further expansion, Precision rededicates itself to serving the aerosol industry and its customers. A major portion of Precision's new plant program will be directed toward research and development; its modern production facilities further improved; its friendly hand extended and dedicated to helping everyone.

Yes, Precision's roots are deep . . . its aim high!

**PRECISION VALVE CORPORATION • 700 NEPPERHAN AVENUE, YONKERS, N.Y.**

# NIAGARA "no frost"

**YOUR REFRIGERATION . . . fully automatic**

● You have continuous line production, the quickest freezing of raw or cooked food by the Niagara air method, always holding the highest quality. Niagara "No-Frost" makes your refrigeration fully automatic with uniform temperature and ALWAYS full capacity, with none lost by the icing of cooler coils. You have always a clean, sweet freezer or cold room. You save labor and your upkeep cost is the lowest. You get full capacity refrigeration from your plant at the lowest power cost.

*Write for Bulletin No. 105*

**NIAGARA BLOWER COMPANY**

**Dept. FP-5, 405 Lexington Ave., New York 17, N. Y.**

*District Engineers in Principal Cities*

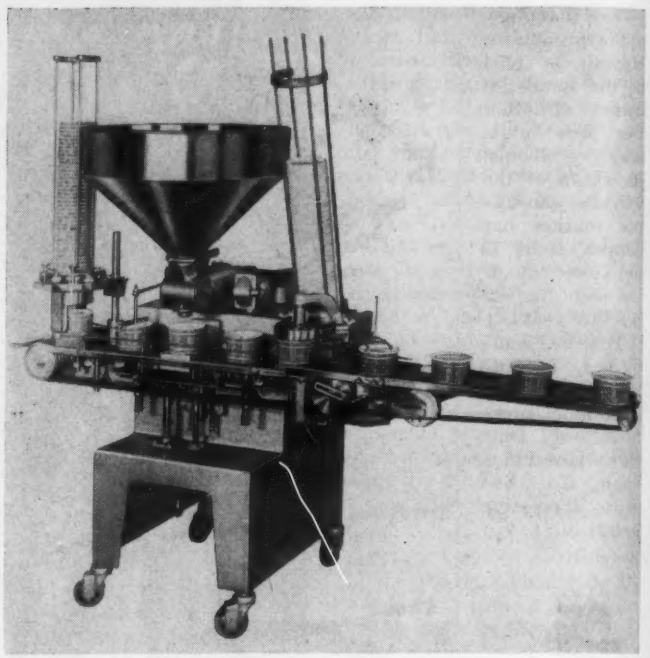
7231 on Reader Service Slip.

**need more information . . .**

Note there is a key number at the end of editorial articles or advertisements. To request more information circle the proper number on the convenient form opposite the last page. Send the form to us . . . we do the rest. Information comes direct to you. No obligation, of course.




Model 340 (shown) comes completely equipped; however, economy models can have excluded items added as optional equipment



# Smooth, precise fill without product breakdown

**. . .plus quick adjustment to changes in cup size from eight oz to 32 oz**

NEW line of cup-filling-capping equipment, replacing one series of manufacturer's earlier line, incorporates a valve-and-piston principle that assures smooth precise fill—important in case of large-curd cottage cheese and similar foods. Product breakdown is virtually non-existent.

Units easily handle large- and small-curd cottage cheese, sour cream, snack dips of all types, whipped butter, potato salads, cooked beans, chop suey, chili, chicken salads, honey, gelatin salads and other food products.

All units handle a full range of nesting-type round cups, from eight to 32-oz capacities, and apply lids of paper, plastic, paper-and-metal or plastic-and-metal. A special cylinder is available for filling even smaller sizes.

**Four different models,** two hopper-fed and two direct-fill, are essentially similar.

Standard Model 340 incorporates a 20-gal hopper and a variable-speed drive that allows filling and capping from 25 to 60 cups per min. This unit has casters for mobility,

leveling legs for stability and a stainless-steel hopper cover.

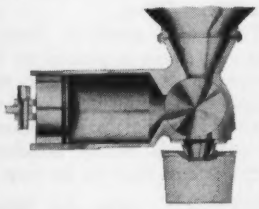
Economy version of standard model (Economy Model 340-2) has a 12½-gal cone-shaped hopper, and a fixed machine cycling speed of 40 cups per min.

Other two units in line (Standard Model 340-1 and Economy Model 340-3) have no hopper, instead come equipped with a three-in. sanitary inlet for direct filling.

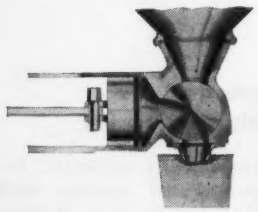
All four models meet or surpass sanitary requirements in all areas, are easy to disassemble and clean thoroughly, due to relatively few parts. All machine parts contacting the product are of stainless steel or nickel silver.

Conveniently located ball crank handles control fill to specified weights and measures, and raise or lower table

**Smooth, safe filling principle**



Filling principle is different from that used in manufacturer's earlier units. Withdrawal action of piston (left) coincides with rotation of cylinder spout mouth directly beneath hopper (inset circle), and product thus is drawn into cylindrical chamber.



Forward thrust of piston coincides with rotation of cylinder-chamber to point directly in line with filling spout, and product passes into cup.


SCOTCH BRAND

TAPEnology... industry's newest cost-cutting tool

## "Tattle-tale" tape stripes itself under heat, gives you positive proof of sterilization

Here's a fast, easy, food sterilization testing-technique you can use right now. Simply tab a short strip of "SCOTCH" BRAND Autoclave Tape No. 222 to various "judas" cans being sterilized. When steam-heat pressure in retort reaches 240° F. or more, dark-colored stripes appear on tape—indicating everything's OK. Failure of stripes to appear "tattles" that proper sterilization hasn't occurred and that cans should be placed back in retort.

On in seconds—"SCOTCH" Autoclave Tape adheres to cans throughout sterilization and cooling. Peels off easily at time of packing. Tape tabs can be written on with ink, pencil or crayon—tabbed to production records as proof that batch passed test.

With "SCOTCH" Autoclave Tape you can spot-check against improper processing in vertical or continuous retorts in minutes. Positive proof of sterilization assures dollar savings—permits cutting spoilage losses to less than 0.01%.

**What do you process?** The ingenuity and technical resources of your 3M Representative are at your service. Ask your "SCOTCH" BRAND Tape Distributor or write: 3M Company, 900 Bush Avenue, St. Paul 6, Minnesota.

*When tape costs so little, why take less than "SCOTCH" Brand?*

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.
EXPORT: 99 PARK AVE., NEW YORK 16. CANADA: LONDON, ONTARIO

MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

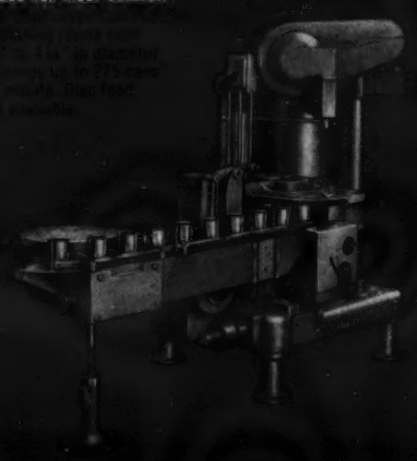
3M COMPANY

SCOTCH BRAND
SCOTCH BRAND
SCOTCH BRAND
SCOTCH BRAND
SCOTCH® BRAND
SCOTCH BRAND

7232 on Reader Service Slip.

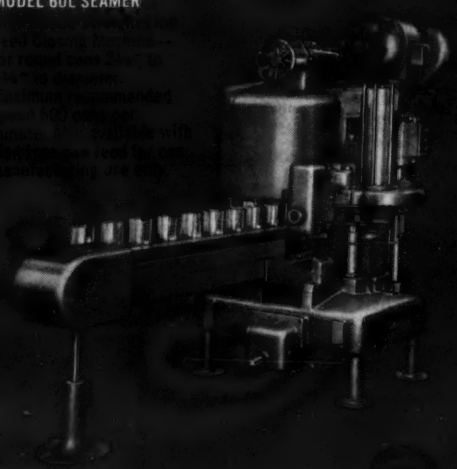
Which ANGELUS CAN CLOSER for you?

MODEL 40P-MSLF SEAMER

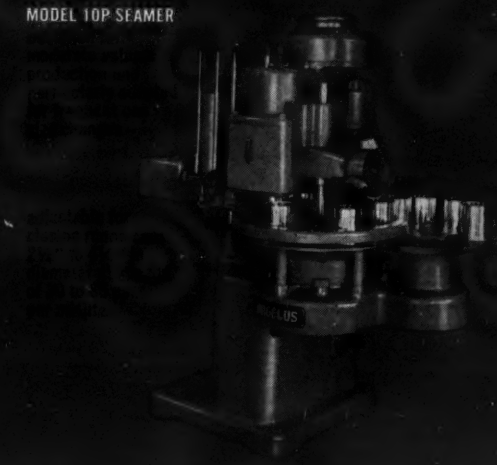


MODEL 50P SEAMER

MODEL 60L SEAMER



MODEL 10P SEAMER



ANGELUS
Sanitary Can Machine Company

Cable Address "Angelmaco" Western Union Code
4900 Pacific Boulevard • Los Angeles 58, Calif.

WRITE TODAY


7233 on Reader Service Slip.

to suit containers being run. Adjustments can be made when the machine is either idle or in motion.

Only one cup dispenser is needed, and may be changed from one cup size to another quickly and without tools by adjusting the dispenser rack and changing the set of dispenser screws.

**In the filling operation,** individual cups are stripped from the stack and dropped onto the conveyor by an automatic, positive-action screw-type dispenser.

Progressively, they are transported to a position under the filling valve where a slotted platform raises each cup closer to the nozzle for even, splashless filling.

Then the platform lowers and cup again is picked up by conveyor and brought to the capper. Here, the inset or coverall lid (either paper, plastic or metal) is firmly attached, and the cup sent on its way.

(Automatic units for filling and capping all types and sizes of nesting round cups, available in Standard Models 340 and 340-1 and Economy Models 340-2 and 340-3, are manufactured by Anderson Bros. Manufacturing Co., 1907 Kishwaukee St., Rockford, Ill.) 7234 on Reader Service Slip.

### Marks and codes without liquid ink

**Uses:** Fully automatic, friction-operated machine marks and codes all types of porous packages, cartons, bags and shipping containers while attached to conveyor, case sealer or other packaging or handling machine.

**Features:** In place of customary fluid inks, ink reservoirs, felts and solvents, unit features an inking cylinder made of "Porelon," the mi-

For more information on product at right, circle 7235 . . . see information request blank opposite last page.

OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, BAGS, CELLOPHANE, POLYETHYLENE FILM

OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER
Write for illustrated Brochure "The Olin Carton Service"

*It takes more than paperboard to make*

OLIN
CARTONS

*package design*
***• printing skills***
***• modern equipment • resources***
***• basic research • quality control***
***• dedication . . .***

OLIN MATHIESON
Packaging Division
P. O. Box 488, West Monroe, Louisiana

With a Fuller Airveyor Conveying System . . .

# Unloading 30 Tons of Feed Ingredients In Less Than One Hour Is a One Man Job at Ralston Purina

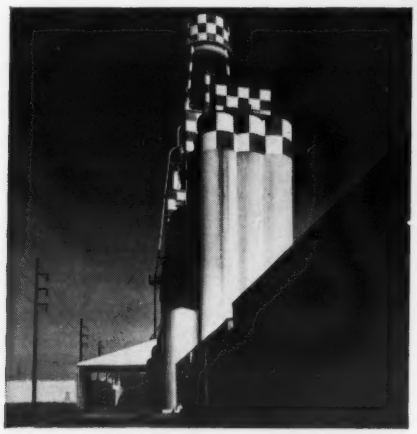
A Fuller Telescopic Airveyor® pneumatic conveying system moves bulk animal and poultry feed ingredients from siding to storage at Ralston Purina's Harrisburg, Pa., mill. The operator keeps the Airveyor nozzle buried in the material by regulating the length of the hose—the telescopic Airveyor conveying system does the rest.

Soybean meal, midds, bran, and other ingredients are sucked vertically 165 feet up 12 stories to any one of 30 storage bins. As the operator works deeper into the car, he simply pushes a button to raise or lower the hose one foot or twenty to reach *any* point within the car. Work never stops to add or take off sections of hose.

Obtaining the savings inherent in bulk purchasing, eliminating the dust hazard, and greatly reducing handling costs are some of the ways Fuller Airveyor conveying systems cut operating expenses in the moving of dry, bulk materials.

Consider the low initial cost and many operating economies of Fuller pneumatic conveying systems when you plan to increase plant capacity. Write or phone today outlining your problem. Fuller will gladly furnish additional information with appropriate recommendation. 1323C A282

Operator controls unloading of feed ingredients at rate of 30 tons an hour — up 12 stories to storage, just by pushing a button.



FULLER COMPANY GENERAL AMERICAN TRADE MARK

**FULLER COMPANY**
**176 Bridge St., Catasauqua, Pa.**
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

**Fuller**
. . . . pioneers in harnessing AIR

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## Cut Costs with SEALTITE

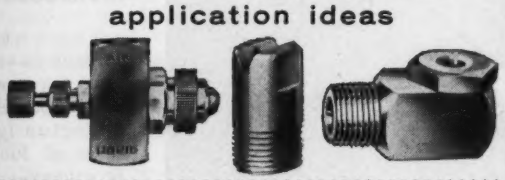
- Delivers a well settled, nicely squared bag at top, bottom and sides
- Pre-scored, double fold, uniformly glued seal keeps product in and dirt out
- Uses any standard make of gusseted bag — no royalties
- Seal readily opened, yet tamper-proof
- Seals 30 to 50 bags per minute
- Users report costs reduced up to $500.00 per month per machine

*Write for complete information*

**CONSOLIDATED PACKAGING MACHINERY CORP.**
A Subsidiary of International Paper Company
BUFFALO 13, N.Y.

7237 on Reader Service Slip.

some
## SPRAY NOZZLE
application ideas



**for lower cost, better production**

- use pneumatic atomizing nozzles on fruit and nut packaging lines for automatically opening bags and placing fumigant.
- you can add water to dry foods by spraying in precise form and quantity for exact control of moisture content.
- If you have a roof heat problem over ovens in summer, roof cooling spray nozzles will reduce temperatures as much as 18° F.
- clean transport truck tanks with spray nozzle heads . . . eliminate costly hand cleaning.
- where water is used anyway and where products will float, a water trough conveyor is an idea, with spray nozzles used to keep products moving.

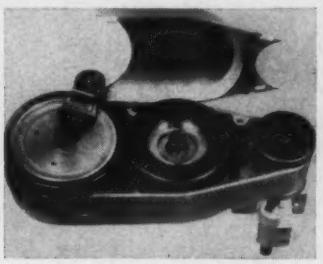
DATA SHEETS are available on a wide range of spray nozzle applications. Just write and describe your particular need.

**SPRAYING SYSTEMS CO.**
3213 Randolph Street • Bellwood, Illinois
FOR GENERAL SPRAY NOZZLE INFORMATION . . . write for 48-page reference Catalog No. 24.

7238 on Reader Service Slip.


cro-porous, micro-reticulated plastic produced and trademarked by S. C. Johnson & Son, Inc., Racine, Wis.

Maintenance and operation



"Porelon" plastic inking cylinder is revealed at center, under upraised cover

are simplified because Porelon cannot drip or gum up, will not smudge.

**Description:** Coder can be used in any position, to print on any surface of shipping container or package. It will print copy up to 12 in. in depth, 12 in. in length.

Each Porelon cylinder will deliver up to 125,000 impressions; when exhausted or when a color change is wanted, it can be changed in less than 30 sec.

(Teko Coder, equipped with special "Porelon" plastic inking cylinder, is manufactured by Thomas Engineering Co., 9257 N. Laramie St., Skokie, Illinois.)

7239 on Reader Service Slip.

"That's me, 2nd can on the left."


*whether you need 1 or a carload*

# CALL ON INLAND FOR HIGH QUALITY STAINLESS STEEL DRUMS

If you ship chemicals, acids, pharmaceuticals, foods or other products that require the extra protection of stainless steel, it will pay you to check the many advantages of Inland Stainless Steel Shipping Drums. Manufactured in a range of sizes from 15 to 60 gallons, from many types of stainless steel, with double-seamed or all welded construction, with all modifications necessary to meet ICC specifications 5 and 5C. Inland can supply the right drum for your requirements . . . whether you need 1 or a carload!

Also available with rubber rolling hoops if desired.

*One of Inland's Stainless Steel Shipping Drums. An ICC 5C drum, 55 gallon, 16 gage, all welded construction (flanges, heads, bottoms and side seams) I-bar rolling hoops. Many other sizes and types are available. Call on Inland for your process drums and stainless steel shipping pails too!*

**free** "The Use and Care of Stainless Steel Drums"

*Here is a useful, new booklet. It gives valuable information on how to use and get maximum life from stainless drums and fully describes the Inland line. Send in this coupon for your free copy.*

☐ *Please send free copy of "The Use and Care of Stainless Steel Drums"*
☐ *Please have your representative contact me.*

Name _____ Title _____
Company _____
Address _____
City _____ Zone _____ State _____

member of the INLAND steel family

INLAND STEEL CONTAINER COMPANY
*Division of Inland Steel Company · 6532 South Menard Avenue, Chicago 38, Illinois · Plants: Chicago, Jersey City, New Orleans, Cleveland and Greenville, Ohio.*

Full line of steel and stainless steel shipping and processing containers, including galvanized and heavy duty ICC drums.

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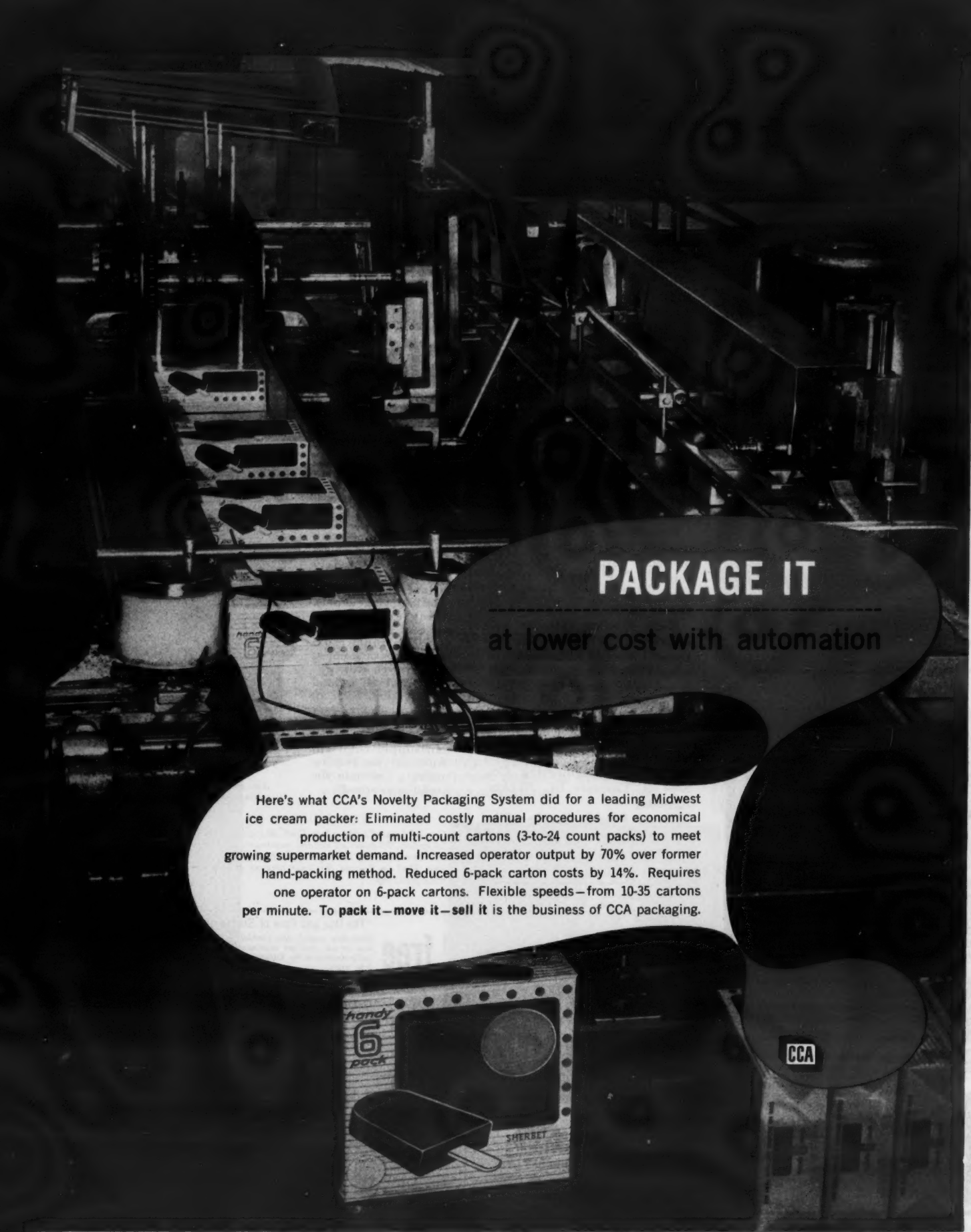

PACKAGE IT
at lower cost with automation
Here's what CCA's Novelty Packaging System did for a leading Midwest ice cream packer: Eliminated costly manual procedures for economical production of multi-count cartons (3-to-24 count packs) to meet growing supermarket demand. Increased operator output by 70% over former hand-packing method. Reduced 6-pack carton costs by 14%. Requires one operator on 6-pack cartons. Flexible speeds—from 10-35 cartons per minute. To pack it—move it—sell it is the business of CCA packaging.
handy
6
pack
SHERBET
CCA
CONTAINER CORPORATION OF AMERICA, Chicago 3... and all key marketing areas. Folding Cartons, Shipping Containers, Sefton Fibre Cans, Molded Plastic Products


***that's interesting***

**And the last shall be first**

Tuna, last major sea food to be canned commercially, is today the largest volume sea food packed in the U. S., according to National Canners Assn. Last year's record pack of more than 14 million cases of tuna doubled the 1949 volume of just over seven million cases, and represented a 98.4 per cent gain for the industry in the 1949-59 decade — a rate of growth roughly five times the increase of the U. S. population in that period.

***About mushrooms***

The name "mushroom," used for a vegetable class which is actually a type of fungus, is originally derived from the word "moss," of Teutonic origin. The Latin word for moss is "muscus" and Old Slav is "muchu." The Middle English term for mushroom was "muscheron."

For more information on product at left, circle 7241 see information request blank opposite last page.

**Descri adhes**

All cord-li grip ad compile

Besid ing bo types o the lite uses as making, packagi sealing

Descri hesive tion da about te complete

(Thermo is availa Machine Federal chusetts. 7242 on

**Tighter on alum**

Uses: machine aluminum ner trays, course tr other alu

Features makes pos crimp, eve ners of c

Descripti stock rat sheets, and 10 in. shee cover a 7 tray as ef economical ously requi in. pre-cut

Machine is geared f line operat discharge. with electri printed foil without, if

("Reycon T developed j sen Manufa 13th & St. Wisconsin, Reynolds M Richmond 18 7243 on Rea

### Describes applicators for adhesives in coils

All vital information about cord-like, hot melt Thermogrip adhesive system has been compiled into new catalog.

Besides listing and illustrating both wheel and nozzle types of adhesive applicators, the literature describes such uses as in bag and folded box-making, carton closing, food packaging and moisture-tight sealing of multiwall bags.

Descriptions of various adhesive formulations, application data and information about test laboratory services complete the book.

(Thermogrip catalog, 166 pp, is available from United Shoe Machinery Corporation, 140 Federal St., Boston 7, Massachusetts.
7242 on Reader Service Slip.

### Tighter crimp for foil lids on aluminum containers

**Uses:** Completely automatic machine positions and crimps aluminum foil on frozen dinner trays, pot-pie pans, main-course trays and variety of other aluminum containers.

**Features:** Improved machine makes possible an extra-firm crimp, even on rounded corners of containers.

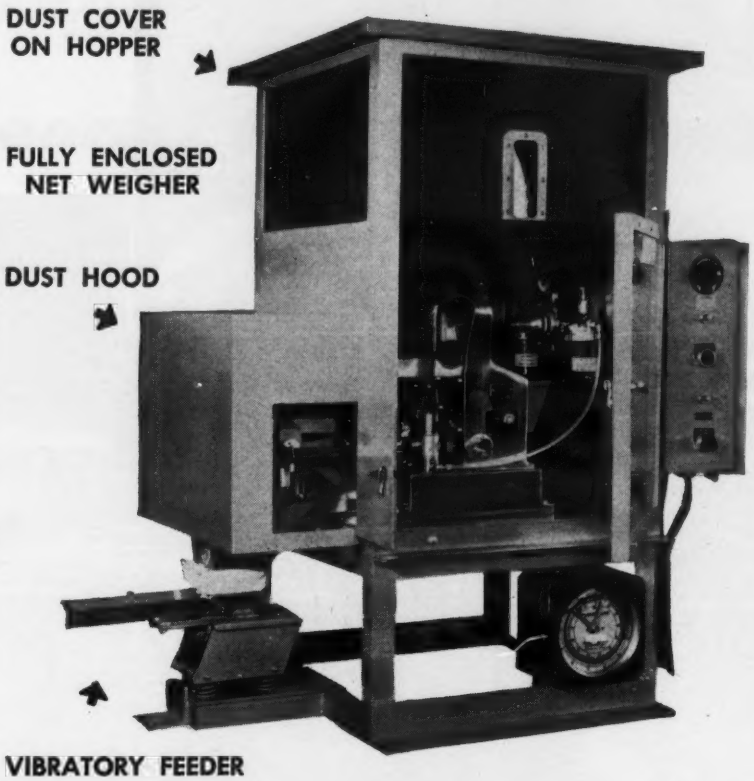
**Description:** Unit uses roll stock rather than pre-cut sheets, and makes an 8 in. by 10 in. sheet cut from the roll cover a 7 in. by 9 in. dinner tray as effectively and more economically than the previously required 8¼ in. by 10¼ in. pre-cut sheet.

Machine is easy to install, and is geared for either straight-line operation or right-angle discharge. It comes equipped with electric eye register for printed foil roll stock — or without, if plain foil is used.

("Reycon Tuckwrap" machine, developed jointly with Haysen Manufacturing Company, 13th & St. Clair, Sheboygan, Wisconsin, is available from Reynolds Metals Company, Richmond 18, Virginia.
7243 on Reader Service Slip.


# Exact Weight® HIGH PRECISION

## Timed Feeding




## For adding concentrates in precise amounts

This Exact Weight machine feeds dry, free-flowing materials, such as concentrates, with complete flexibility of control. Accurately timed feeding of material over a given period of time guarantees controlled integration of product to the stream. The net weigher, hopper and discharge trough are fully enclosed for protection against dust.

Exact Weight machines of this type are currently being used in food, chemical and pharmaceutical processing operations. Machines are available in capacities from 1 gram to 300 pounds.

Exact Weight weighing equipment is backed by 45 years of experience in building job-engineered scales for all types of applications. We offer experienced advice and factual data on the best method to weigh your product. Request Form 3311.

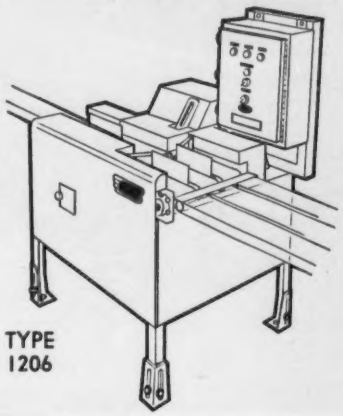
Exact Weight SCALES

**THE EXACT WEIGHT SCALE CO.**
909 W. FIFTH AVE., COLUMBUS 8, OHIO
In Canada: 5 Six Points Road, Toronto 18, Ont.

BETTER QUALITY CONTROL . . . BETTER COST CONTROL

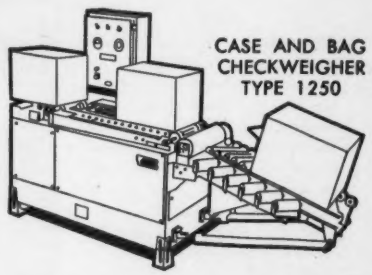
7244 on Reader Service Slip.

## Other Exact Weight Equipment

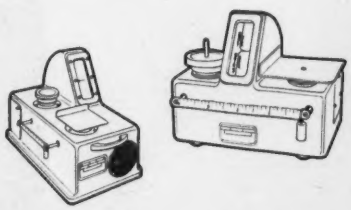



### SELECTROL® AUTOMATIC CHECKWEIGHERS

Weighs, classifies and sorts products or packages into overweight, underweight and correct weight groups. Up to 120 items per minute with accuracies of 2/10 of one percent of product weight. Sorts open or closed packages.




Selectrol designed for checking bags, cartons and cases from 20 lbs. to 100 lbs. offers accuracy one-tenth-of-one percent. Speeds to 30 units per minute. Supplied with or without rejection equipment.



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***Sales and Service Coast to Coast***

**At Lodi, Calif.,**

▲ Accumulation storage lines here are held back by stop belts. Next step is counting cases automatically for pallet loads

▶ After being counted in pallet-load quantities and spaced on metering belts, cases move over top or bottom line of a double-deck belt conveyor (far background), are transferred via hinged belt-conveyor section (arrow) onto single-deck belt conveyor (foreground) feeding automatic palletizer

- **No jam-ups despite multi-line infeed of various product types, carton sizes**
- **Major components — special vertical conveyors, live-roller accumulating conveyors, automatic palletizer**

*cake-mix operation of General Mills . . .*

# Engineered automatic handling integrates spread-out operation

**NORB LEINEN**
Associate Editor

AUTOMATIC handling is the key to high-rate production at General Mills' two-year-old Lodi, Calif., plant.

Outstanding example of this is the efficient movement of cake mix from the multiple-unit production line onto pallets — involving several handling phases and an over-all linear distance of more than 600 ft.

**Key features** of the completely automatic conveying-palletizing system are the special vertical conveyors, the accumulating conveyors and the automatic palletizer.

Originally designed and fabricated especially for the Lodi installation (because of lack of sufficient floor space for the conventional incline-belt conveyors), the index-type verticals recently have been introduced as a standard equipment item in manufacturer's line (FP, Feb. 1960, pp 71-72).

Operating at a maximum rate of 90 fpm, units handle more production than possible with "dumbwaiter-type" verticals, which have reciprocating car traveling between upper and lower levels.

Here, conveyors consist of a series of lightweight cantilevered carriers suspended between two parallel strands of chain, and uniformly spaced.

When package is delivered to vertical conveyor, unit automatically indexes upward so that the next empty carrier is brought into position. Succeeding packages cause the conveyor to continue to index upward.

With this arrangement, after ascending side of conveyor is filled with cases, these are discharged at upper level at same rate as they are received at lower level. No time is lost in having an empty car return to lower level, as in case of dumbwaiter-type vertical.

**Accumulating conveyors** are of special power-driven live-roller type, designed to provide sufficient tractive effort to insure that packages move forward promptly without build-up of undue pressures against package sides.

To further insure against pressure damage to packages, accumulating conveyors are broken up into "units," and controls so arranged that when the forward unit is completely filled with packages, this unit automatically shuts down.

Next unit back continues to run until it is filled; then it, too, shuts down.

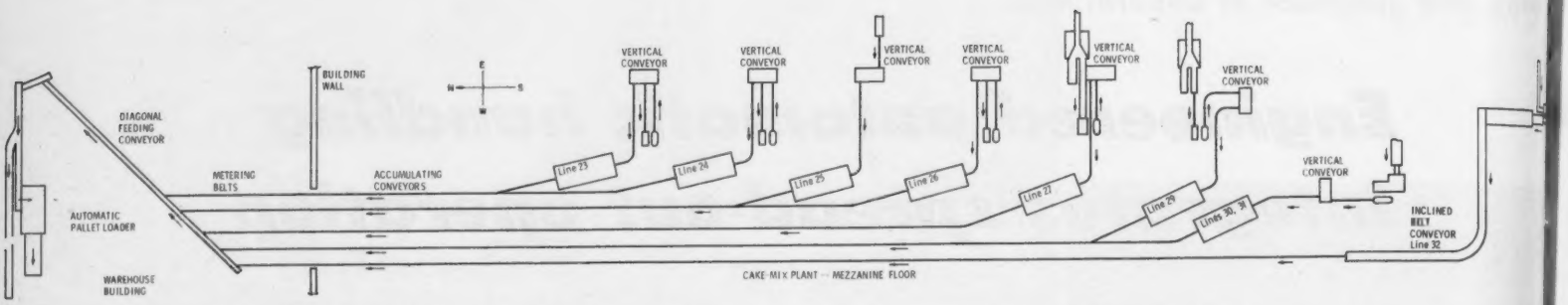
Net effect is that packages automatically move very much like automobile traffic as it approaches a stop light.

**Palletloading machine** handles 50 to 60 cases per min — the rate depending on size of cases, and how many cases there are per layer for a given-size pallet.

When a palletload of an in-

Automatic pallet loader has discharged two palletized loads — each with a different load-pattern, and is beginning to form a third palletload according to preset pattern and height "instruction"

# *Engineered automatic handling . . .*




**Smooth, controlled case handling** from production to palletizing is shown in simplified schematic above; however, widely spread-out operations are somewhat condensed here because of page-width limitations. Vertical conveyors link the first floor production operation (not shown) with the mezzanine floor, feeding cases of packaged cake mix to their respective case sealers (rectangles) on mezzanine.

Accumulating conveyors for Production Lines 27 and 32 are single-deck; the other three accumulating conveyors are double-deck. In actual plant layout, there is sufficient space between Lines 27 and 29 for a future Production Line 28

dividual package variety has accumulated on any of the eight conveyor lines, electric controls signal this information to pallet loader.

Unit then automatically adjusts itself to receive the particular package, to stack it in one of the eight patterns previously selected and to put onto the pallet the number of layers previously determined.

Machine has built-in provision for changing number of layers deposited on any pallet simply by changing the setting of a control switch provided for this purpose.

**System begins** with the production machinery located on plant's first floor.

Output of eight production lines (Nos. 23, 24, 25, 26, 27, 29, 30 and 31) is packed in top-loaded cases and delivered to belt conveyors, which, in turn, deliver to special vertical conveyors.

(On three of the production lines, vertical conveyors were designed so that it was possible to build them right around the production machinery.)

Vertical conveyors carry the cased packages to battery of case sealers located on mezzanine floor, directly above the respective production lines.

(Line No. 32 differs from the others in that cases are sealed immediately after leaving production line, then go by means of belt conveyor and roller gravity-curve to a long belt conveyor which inclines upward to mezzanine floor.)

**From mezzanine floor,** the sealed cases are conveyed via accumulating conveyors to warehouse building. Although the plan view shows only five accumulating conveyor lines, actually there are eight, since three of the lines are double-deck.

Accumulating conveyors serve two purposes: 1) deliver packages over to a pallet loader in warehouse building; 2) provide a means of accumulating cases from production.

These conveyors are of sufficient length to provide room for additional production during a period of time when a particular line may be waiting to be served by the automatic pallet loader.

This situation can occur when two or more of the eight lines accumulate a palletload of cases simultaneously. When a palletload of a particular variety of package has accumulated on any conveyor, electric controls signal this information to the pallet loader, and this unit then automatically adjusts itself to handle the cases. At the same time, the metering belt conveyor on the particular line supplying cases starts up and counts out the proper number of packages for that specific palletload.

When the pre-selected "x" number of cases has passed the counting device, the metering-belt conveyors automatically stop, preventing passage of any additional packages.

This automatically provides the proper number of cases of that particular size package for a palletload.

After the counted cases are released in palletload quantities by the metering-belt conveyors, they proceed along a double-deck diagonal conveyor in direction of the pallet loader. (Two decks are needed since some of the accumulating conveyors are double-deck.)

In order to get flow of cases onto a single-deck conveyor which actually feeds the pallet loader, a hinged belt-conveyor section is employed.

Belt's receiving end moves up and down automatically as required, serving both decks of the double-deck diagonal conveyor.

Forward end of hinged belt is at a fixed elevation and discharges directly onto line leading to pallet loader.

Movement of the hinged belt either to the upper or lower deck of diagonal feeding conveyor is automatically controlled so that packages will be drained out of all eight accumulating lines automatically.

Just before arriving at pallet loader, cases pass a deflecting station. At this point it is possible, at the option of operating personnel, to "drain" off cases and route them to a manual palletizing station.

However, under normal operation, cases flow to palletizer automatically. END

*Automatic handling system at General Mills, Lodi, Calif., was designed, engineered, manufactured and installed by Alvey Conveyor Manufacturing Co., 9301 Olive Street Rd., St. Louis 32, Mo.*

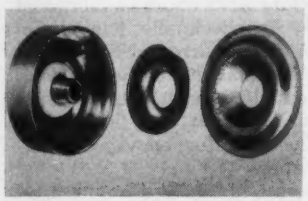
7245 on Reader Service Slip.

**New bearing material key to**

## Corrosion-resistant conveyors

**Uses:** New corrosion-resistant conveyor models are designed for use in areas of high humidity, sea-shore locations, aboard ship and wherever a conveyor must be operated under wet conditions, or washed or sterilized frequently by steam or water-chemical solutions.

**Features-Description:** The conventional steel balls ordinarily used in aluminum gravity conveyor wheels designed for installations involving corrosion problems have been



Arrow shows position of "Delrin" bearing within roller wheel

replaced by a ring of "Delrin" (see photo) — an acetal resin developed by Du Pont.

To enhance the corrosion resistance, the aluminum used in the wheels is a special salt-water-resistant alloy.

The resultant wheels are virtually noiseless compared to steel ball bearing wheels. Weight saving of 40 per cent is made compared to aluminum wheels with steel balls, and 60 per cent compared to steel wheels with steel balls.

Wheels with the new bearing are limited to six lb. capacity per wheel. However, additional line capacity can be gained by using more wheels per ft of conveyor.

(New line of corrosion-resistant conveyors with bearings made of "Delrin" is development of The Rapids-Standard Company, Incorporated, 342 Rapistan Building, Grand Rapids 2, Mich.)
7246 on Reader Service Slip.

Baker William Wilson checks the biscuits near the exit of the USS Cyclone Conveyor Belt.

American Steel & Wire
Division of
United States Steel

USS

Cyclone sales offices coast to coast

## "We've eliminated downtime completely with a USS Cyclone Conveyor Belt"

"Since we installed a USS Cyclone Steel Conveyor Belt in our direct-fired biscuit oven, we've had a record of 100% production *every day*," says Mr. William C. Warner, President, Warner Dog Food Company, Inc., Brooklyn, New York. "But it was a different story with the old-fashioned belt we *used* to use. Because the oven bakes approximately one ton of biscuit dough an hour, we suffered a substantial loss every time it was shut down for repairs. The repairs couldn't even start until the oven had cooled for a full hour and was no longer dangerous to touch.

"Production during these downtime periods was lost forever, because once the repairs were completed, the oven couldn't be speeded up. The cycle time had to remain constant to insure thorough baking and uniform consistency. On many occasions, even a minor repair job meant no more production for the day, because the time and expense involved in reheating the oven weren't justified if a major part of the day was over.

"These frequent troubles convinced us we should switch to a USS Cyclone Conveyor Belt. We placed our order, and the belt was delivered as scheduled, with no delays or excuses. And we're entirely satisfied with its performance. The belt has required no service or maintenance whatsoever. We certainly wouldn't hesitate to recommend it to others."

Wasted man-hours—no matter what the cause—can be a headache in *any* plant. Wouldn't *your* plant profit from an increase in daily production? A USS Cyclone Conveyor Belt system can help you do it. The Cyclone line is the most complete line of metal conveyor belts offered by any belt manufacturer. Find out which one is right for *your* product—just send for our free booklet.

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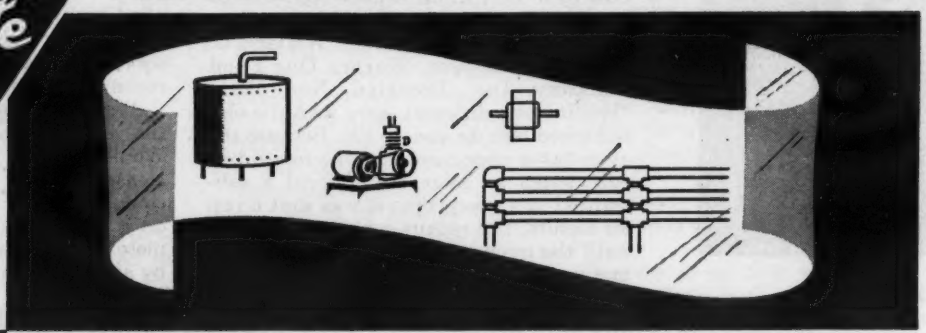

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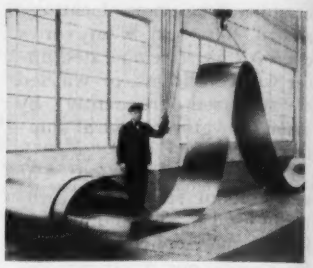
### Extra-wide, one-piece steel conveyor belts

New wide one-piece conveyor belts have been developed to fulfill increasing requirements of both the food processing and chemical industries for wider single-strand steel belts.

Formerly, maximum available width was 32 in., although



Belts come in widths to 48 in.

wider belts could be fabricated by longitudinally joining two or more narrower belts.

Available in carbon or stainless steel, new belts are especially trued and flattened at the mill for conveyor application.

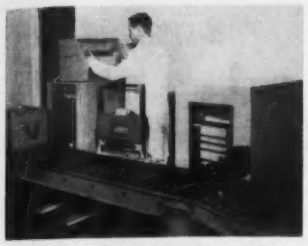
(New extra-wide steel conveyor belts are manufactured by Sandvik Steel Belt Conveyors, Division of Sandvik Steel, Inc., 1702 Nevins Rd., Fair Lawn, N.J.)
7250 on Reader Service Slip.

### Automatically routes boxes to selected stations on line

**Uses:** Automatic conveyor routing system can be used to direct tote boxes, cardboard cartons and other containers to packing stations for broken-lot order assembly, or to direct work through various processing stations.

**Features:** System is designed so that container can be diverted at any station, processed, placed back on conveyor and diverted again at another station for further processing.

**Description:** Routing system is controlled by dispatcher at control console. Dispatcher selects routes by depressing station keys, and the coded



Flexible system handles either single containers or "trains" of containers

instructions are automatically placed on container by an inking coder. Code reading carton selectors accurately control direction of flow.

If container is to be reused, code may be removed automatically by optional equipment, following the last station.

(Model 450 automatic conveyor-routing system is development of Atronic Products, Inc., One Bala Ave., Bala-Cynwyd, Pennsylvania.)
7251 on Reader Service Slip.

### Standard units, systems for aerated bulk transport

Comprehensive illustrated catalog covers all specialized equipment, as well as complete system illustrations, for the aerated transport of granulated, pulverized or pelletized bulk material.

Included are equipment drawings, with specifications, operational information and correlated engineering information.

While only typical standardized units are shown, the manufacturer is a major fabricator of specialized and custom-built systems.

(Cat—"Bulk Handling Equipment"—20 pp, is offered by Systems Engineering and Manufacturing Co., Inc., P.O. Box 7634, Houston 7, Texas.)
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**Fork Lift Features**
**Pages 106-107**

REX WATER & WASTE TREATMENT NEWS
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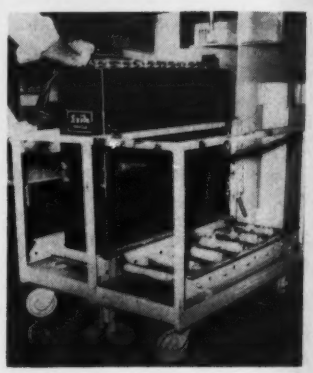
*material handling*

## New developments in fork lift trucks

### Speeds, simplifies fork truck battery switching

Here's a valuable handling time- and labor-saver from a non-food company that should interest food processors.

At International Business Machines Corporation's General Products Division plant, San Jose, Calif., this cart with



built-in twin roller-conveyor sections speeds and simplifies installation and removal of Exide batteries from electric industrial trucks.

Cart serves three purposes: 1) aids removal and switching of batteries in truck compartments, 2) provides simple means of transporting batteries, and 3) serves as workstand for maintenance and repair work on batteries.

Note that deck height of cart is same as height of truck's battery compartment, allowing smooth transition without lifting. Steel rails prevent battery from rolling too far.

(Roller-bed battery-changing cart was fabricated to IBM specifications by Rapistan of California, Incorporated, 1255 Sansom Street, San Francisco 11, Calif.)

7255 on Reader Service Slip.

### Converts small fork lift engines to LP-Gas

**Uses-Features:** While designed primarily for LP-Gas, filter with sintered bronze filter element works equally well with gasoline and other hydrocarbon fuels.

**Description:** Made from Hex brass bar stock, actual dimensions of filter are ⅞ in. wide by 1-7/16 in. long; weight is just two oz. Fuel connections are ¼-in. pipe, and the male outlet permits direct attachment to electric solenoid valve or regulator.

Filter is suitable for most small engine conversions in fork lifts

Filter element is easily cleaned by blowing out in reverse.

(Model F-101 filter for small-engine LP-Gas conversions is manufactured by Beam Products Manufacturing Co., 3040 Rosslyn St., Los Angeles 65, California.)

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"Sam's one of the best potato mashers in the business."


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# FLAT-TOP chains

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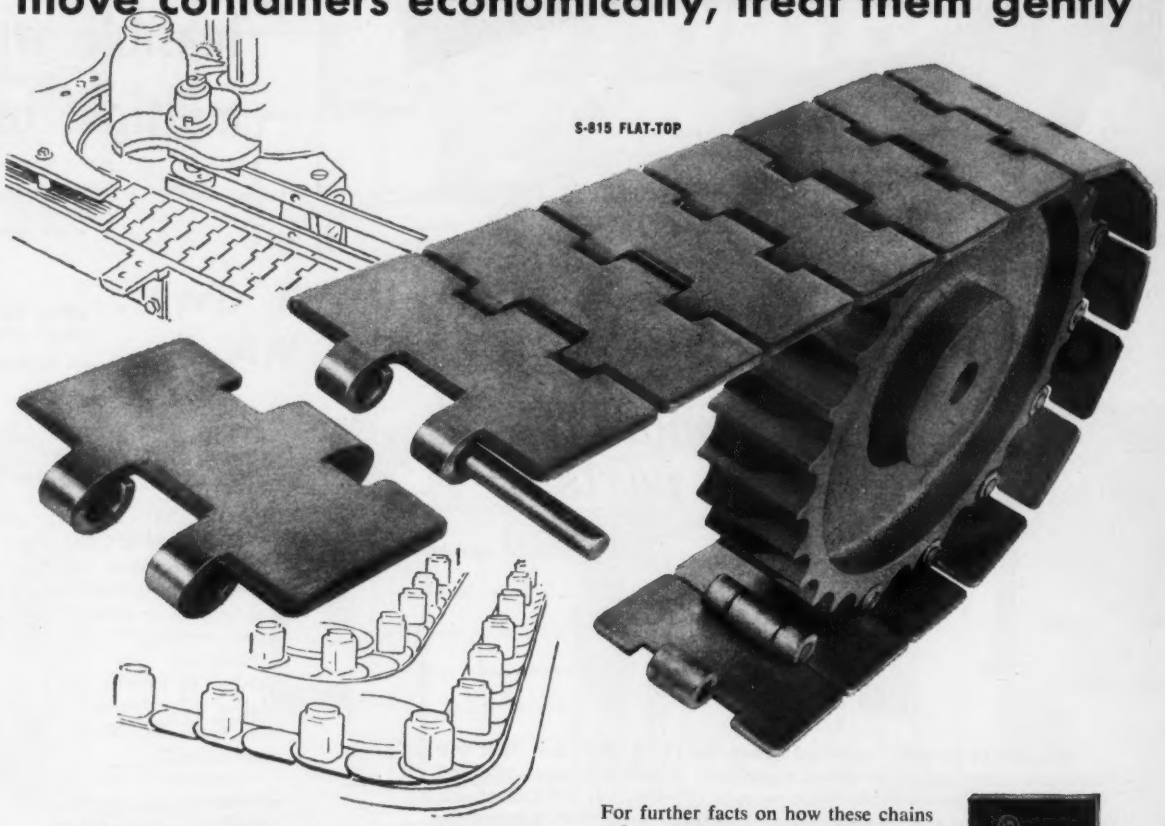


**Go the route—straight path or curved, single plane or several—with a Link-Belt flat-top chain**

For straightline conveyors, *S-815 flat-top* chain is an economical choice. Its one-piece links interlace to form a continuous carrying surface . . . assure smooth transfer of containers from one link to another. If a precision roller chain is preferred, specify *FT-1560 all-steel flat-top* chain for day-in, day-out dependability . . . or *Ny-Steel* with nylon top plates for exceptional wear resistance, quietness and light weight.

Where bottles and cans must be carried around corners or recirculated—*Crescent flat-top* performs safely and dependably. Or choose Link-Belt *Universal Crescent* for multi-plane operation requiring a variety of paths.

And to obtain optimum chain life, use accurately machined Link-Belt cut-tooth sprockets. 15.138

For further facts on how these chains reduce costs on washing, filling, capping, packaging and other operations, call your Link-Belt office or authorized stock-carrying distributor. See CHAINS in the yellow pages. Or write for new, comprehensive Catalog 1050.

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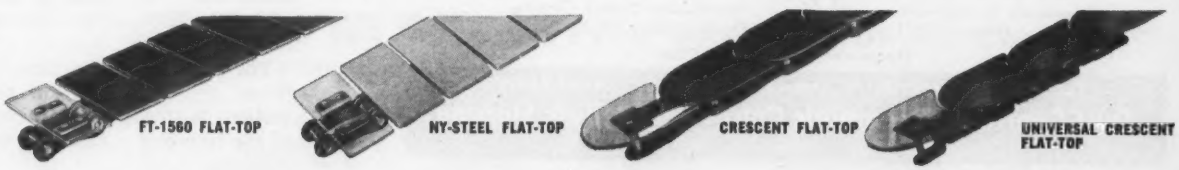


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New DAY "RJ" Dust Filter

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only 3 moving parts

Built under patents of The DAY Company and H. J. Hersey, Jr.

Because of its new, simplified design the DAY "RJ" dust filter will save you many dollars on initial investment, installation, operation and maintenance. Some of the important new construction features of this dust filter are: a new, quick-opening reverse-air, counter-flow valve for maintaining filter media porosity; a new, reverse-air pressure blower arrangement, and new, air tight, yet quickly opened inspection doors.

This patented DAY dust filter has only 3 moving parts but controls dust effectively, efficiently (99.99+%) and economically. It represents the latest refinement in a long-tested, plant-proven dust filter. Using felted filter sleeves to capture dust, the "RJ" is now available in 5 sizes for handling from 300 to 6400 CFM of air (for larger capacities, multiple groupings are furnished).

*For more detailed information write toDAY for free Bulletin G-30. It's filled with facts, specifications and dimensions.*

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# Bulk depalletizing feasible with multiple can sizes

**Quick-change system handles five sizes with one-minute switchover**

**BOYD PREBLE,** plant manager
Oberti Olive Co.
As reported by **KARL ROBE**

**PROBLEM:** Oberti Olive Co., Madera, Calif., wanted to change their empty can handling from bags and manual feeding to bulk depalletizing.

However, no depalletizer existed to handle their formidable requirement—a single unit built to handle five can sizes quickly.

Changeovers occurred three or four times every day and involved size ranges from buffet style to No. 10's.

**Solution:** Since existing waterfall discharges from depalletizers would not accommodate the wide variety of can sizes at Oberti, Continental Can engineers built a disc-type discharge (see photos).

Operator manually sweeps layer of cans off pallet load onto the revolving horizontal disc. A curved shunt on disc single-files the cans through selected opening into can runway.

When a new can size is to be packed, operator merely closes the first opening and changes shunt to the desired line.

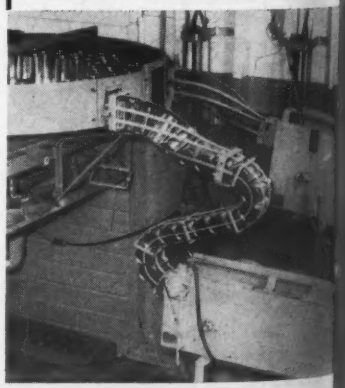
The can runway sections to filters are short, so the old section is merely lifted out of the line and a new one set in place.

Runways extend through can washers, which have removable covers to allow changeover to new size runway sections.

Two washers (see photos) are used, one to accommodate all 211 diam sizes, the other for 301x411 size. No. 10's are

Switch-over is fast: 1) change openings from disc (rear); 2) lift out one runway, slip in another

Disc discharge (upper left) replaces waterfall to handle from buffet sizes to No. 10's



air-cleaned, so by-pass the washers.

**Results:** Bulk depalletizing is now adaptable to the smaller operation. The disc-discharge depalletizer combines the benefits of bulk can savings and one-man bulk-handling operation with the versatility of manual operations.

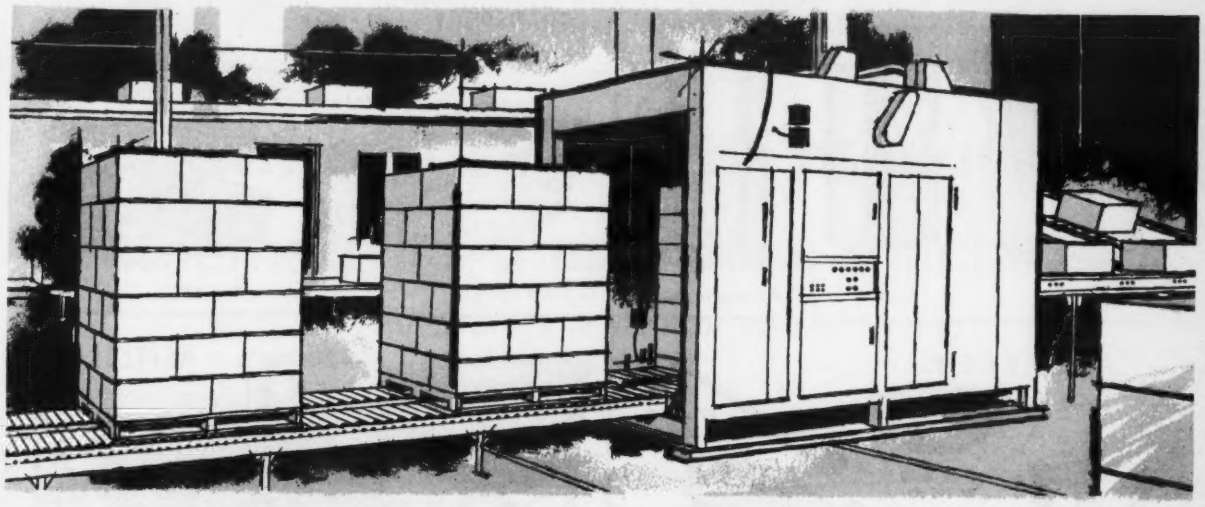
Less floor space is required for empty can handling. New can changeovers take about three minutes, so that production downtime is minimized.

(Disc-discharge was designed and built by Continental Can Co., Can Handling Systems Dept., Hayward, Calif.)

(Key Kan semi-automatic depalletizer is product of Key Equipment Co., 217 East Broadway, Milton-Freewater, Oregon. Newest model features waterfall discharge that is quickly adjustable to other sizes.)

7259 on Reader Service Slip.

**...AND THEN THEY INSTALLED AN ALVEY PALLET LOADER**



**—To Save Time, Work and Money**

A wise move is to run your packaging line directly into an Alvey Pallet Loader. It's the real time-saving, work-saving, money-saving way to break your package-handling bottlenecks.

Individual cases are methodically received from one or several production lines, and automatically arranged in a predetermined pattern at a rate in excess of 45 cases per minute.

Easily adjust your Alvey Pallet Loader. In a few seconds you can change from one size carton to another, or switch from one stacking pattern to another.

For individual handling units, or a completely-integrated conveyor system, call in Alvey's experienced engineers. The cost-cutting possibilities are unlimited.

**ALVEY CONVEYOR MANUFACTURING COMPANY**

9307 OLIVE STREET ROAD, ST. LOUIS 32, MISSOURI • *Branch Offices in Principal Cities*

*ALVEY ENGINEERING PAYS OFF . . . for customers like these:*

Armour
Beatrice Foods

Beech-Nut
Borden Co.

General Mills
Kraft Foods

Maxwell House
National Biscuit

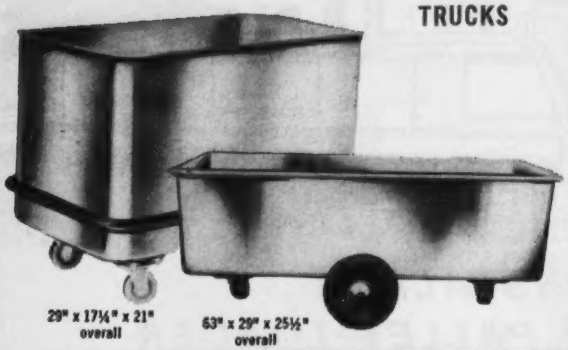
Pet Milk
Welch Grape Juice

7260 on Reader Service Slip.

cut handling and storage costs...

# WEAR·EVER ALUMINUM

TRUCKS



29" x 17¼" x 21" overall

63" x 29" x 25½" overall

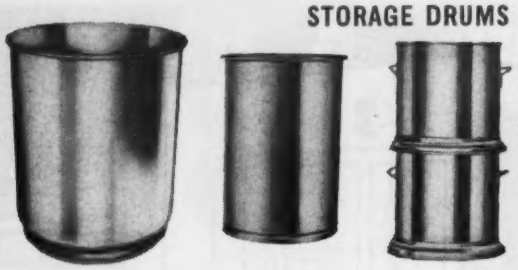
MOBILE BINS

38 gallons

30 gallons

27 gallons

STORAGE DRUMS



50 gallons

30 gallons

4, 6, 9 and 14 gallons

TRANSPORT BOXES

20" x 15" x 5"

22" x 20" x 1¼"

34 3/16" x 16⅛" x 12"

22⅛" x 20½" x 6½"

UTILITY ITEMS

16, 21, 48, 63, 74, 122 qts.

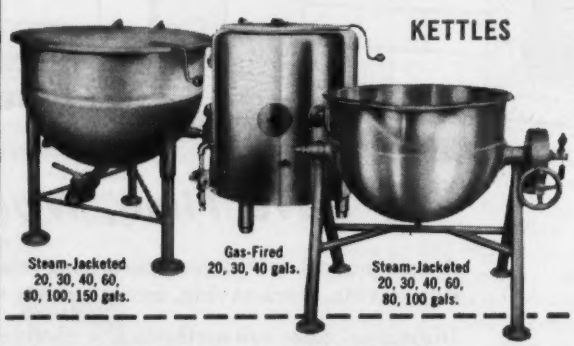
45" and 53"

18, 24, 32, 48 ozs.

10, 12, 14, 16 qts.

2 qts.

KETTLES



Steam-Jacketed 20, 30, 40, 60, 80, 100, 150 gals.

Gas-Fired 20, 30, 40 gals.

Steam-Jacketed 20, 30, 40, 60, 80, 100 gals.

Now you can speed production, and simplify your handling or storage problems with standard, readily available Wear-Ever plant service items like these.

Wear-Ever's complete line of handling, storage and service equipment is constructed from specially developed, tough, hard-wrought aluminum alloys to assure longer life.

Send for your free copy of our new catalog showing the complete Wear-Ever line.

**New Catalog Ready! *SEND TODAY!***

Wear-Ever Aluminum, Inc.
508 Wear-Ever Building, New Kensington, Pa.

GENTLEMEN: *I'd like to learn more about ways in which Wear-Ever's line can help me.*

☐ Send me your catalog ☐ Have your representative see me

NAME_____

TITLE_____

COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____

**WEAR·EVER ALUMINUM, INC., FOOD SERVICE EQUIPMENT DIVISION, NEW KENSINGTON, PA.**

7261 on Reader Service Slip.



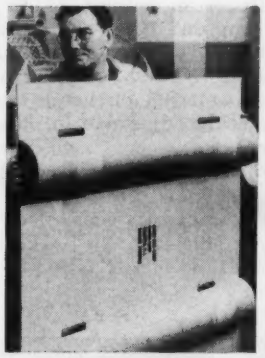
## *Paperboard disposable pallet*

- **Speedy set-up**
- **Featherweight**
- **Strong**

New lightweight, disposable pallet made entirely of paperboard weighs only eight lb, compared with 97 lb for a standard wooden pallet — a saving in dead weight of 89 lb per pallet.

On basis of 16 pallets per truck, payload can be increased by an additional 1424 lb of product.

Pallet consists of a sheet of double-wall corrugated board, to which is attached two half-cores made of laminated kraft paperboard.



Laminated kraft half-cores can be centered to fit any type of fork truck

In warehousing tests, pallets loaded with 30 to 36 bags have been stacked four-high successfully. The laminated kraft half-cores have held up without flattening under loads in excess of 12,000 lb.

Assembly at user's plant can be accomplished by two men in less than one min — using simple assembly jig and pieces of reinforced, gummed paper tape (to secure the half-cores to the platform deck sheet).

(All-paperboard lightweight disposable pallet is development of Union Bag — Camp Paper Corp., 233 Broadway, New York 7, N.Y.)
7262 on Reader Service Slip.

***that's interesting***

**Fang-size sweet tooth**

If candy research is an index to interest in candy, the European sweet tooth is more like a huge fang — because Europeans spend 100 times more money on candy research than do Americans.

This item comes from Hans F. Dresel, president of the American Assn. of Candy Technologists, who visited recently in Europe.

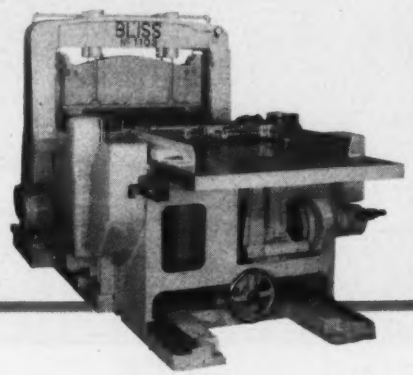
Apropos of this, Dresel observed, "we have definitely broken through the barrier of secrecy and silence that formerly characterized international candy research.

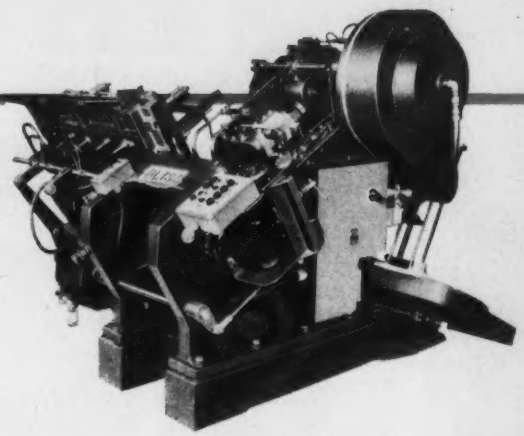
**In Russia, maybe borsch?**

Campbell Soup Co. reveals the interesting intelligence that oxtail soup is the favorite soup throughout the British Commonwealth countries, while chicken noodle soup is the favorite in the Far East. In Cuba, cream of asparagus is regarded as yummiest.

Something of a surprise, though, is the world's largest per capita consumer of soup. It's Bermuda! (Onion soup?)


**New #1103 Automatic Scroll Shear** offers highest production rate ever, shears both lithographed or plain sheets up to 36" square. There's no idle stroke...every stroke is a cutting stroke. First table retracts to permit regrinding of cutters with a conventional cutter grinder without taking them off.

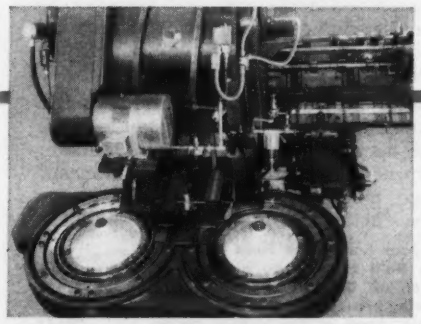


**High speed #1831 Strip Feed Press** blanks and forms can ends up to 404 diameter in double dies. Speeds range from 250 to 325 s.p.m. producing up to 600 or more ends a minute.

# You can end CAN END production problems with these Bliss machines

*(More Bliss end lines are in use than any other make)*



**Double end #20 Automatic Curler** curls ends from 2" to 4¼" diameter; is designed for use with #1831 Strip Feed Press. Independently motor-driven, it does not rely on the press for its drive.

These machines incorporate many refinements in designs that have been thoroughly proved in production over the last four years. Write today for detailed information.

BLISS SINCE 1857

**E. W. BLISS COMPANY · Canton, Ohio**

*BLISS is more than a name—it's a guarantee*

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CONTAINER MACHINERY • CONTRACT MFG.

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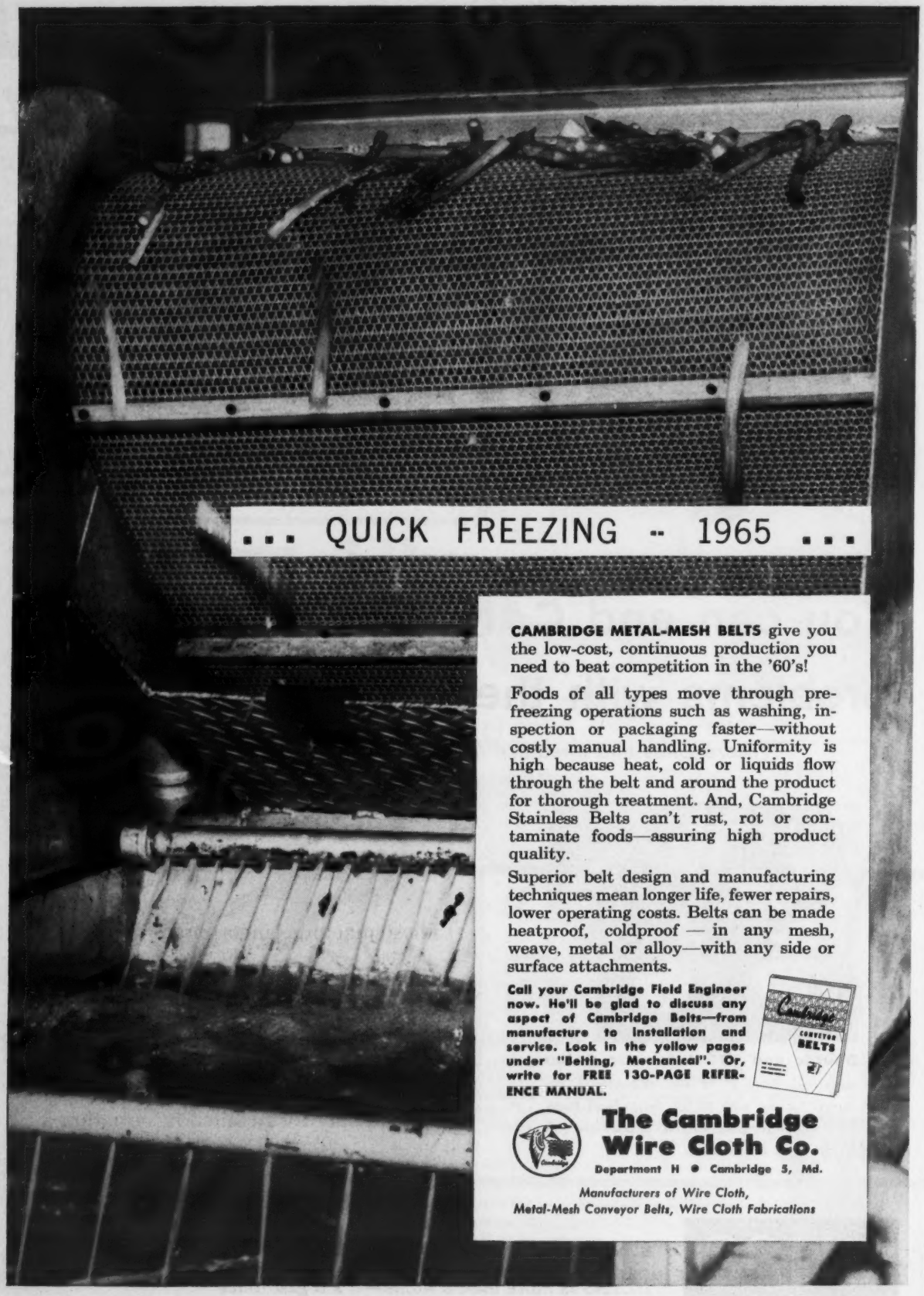



**CAMBRIDGE METAL-MESH BELTS** give you the low-cost, continuous production you need to beat competition in the '60's!

Foods of all types move through pre-freezing operations such as washing, inspection or packaging faster—without costly manual handling. Uniformity is high because heat, cold or liquids flow through the belt and around the product for thorough treatment. And, Cambridge Stainless Belts can't rust, rot or contaminate foods—assuring high product quality.

Superior belt design and manufacturing techniques mean longer life, fewer repairs, lower operating costs. Belts can be made heatproof, coldproof — in any mesh, weave, metal or alloy—with any side or surface attachments.

**Call your Cambridge Field Engineer now. He'll be glad to discuss any aspect of Cambridge Belts—from manufacture to installation and service. Look in the yellow pages under "Belting, Mechanical". Or, write for FREE 130-PAGE REFERENCE MANUAL.**




**The Cambridge Wire Cloth Co.**

Department H ● Cambridge 5, Md.

*Manufacturers of Wire Cloth, Metal-Mesh Conveyor Belts, Wire Cloth Fabrications*

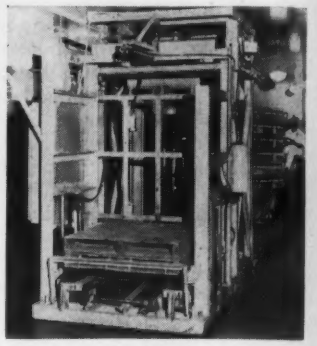
7264 on Reader Service Slip.




### De-palletizes beverage cases at 30/min rate

**Features:** New air-operated, electrically controlled pallet unloader functions automatically as long as it is kept supplied with pallets. A pushbutton control lets operator start or stop case flow at any time.

**Description:** Loaded pallet is moved by fork truck into unloader's receiving end, and



Unit can be linked to a companion pallet loader for a complete cycle

positioned automatically. Two lifting platforms raise top layer of cases, which then are pushed in pairs onto a discharge conveyor.

Conveyor carries cases of empty bottles to the washing, sterilizing and re-filling operation in the bottling plant.

As each pallet is unloaded, it moves into the unloader's pallet magazine. From there the pallets can be transferred to the magazine of a companion pallet loader unit.

(Air-operated, electrically controlled RCA pallet unloader is manufactured by Radio Corporation of America, 30 Rockefeller Plaza, New York 20, N.Y.)

7265 on Reader Service Slip.

GET CURRENT LITERATURE

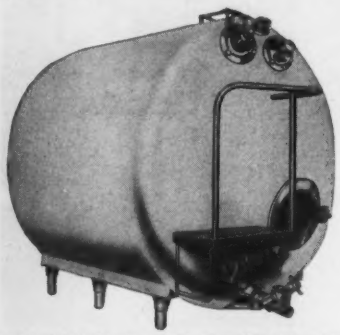
A quick reference to technical literature available this month is given in the classified listing of new literature, page 145 of this issue. Check it now.

WALKER

STORAGE
*and*
TRANSPORT
EQUIPMENT

Wherever storage and transport of food products is required, Walker can supply the unit that will give you dependable economical performance.

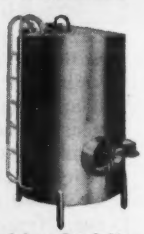
We will gladly supply you with complete data and prices on the equipment you need.



STORAGE TANKS, Round, Oval and Rectangular. All sizes Standard or Cold Wall surface.

TRANSPORT TANKS. Trailerized and truck mounted. One, two or three compartments.

FIBRE-GLASS COOLER DOORS. All types and sizes of insulated doors.



Stainless Steel Vertical Holding and Surge Tanks

Write today for literature on our complete line of stainless steel and fibre-glass equipment for the food industry.

WALKER

WALKER STAINLESS EQUIPMENT CO.
Dept. 45, New Lisbon, Wisconsin

7266 on Reader Service Slip.

Mounted on pallet, filled container may be moved by lift truck; when empty (below) container collapses compactly for return to supplier's plant

Now in use!

# Collapsible container

**. . . eases handling, cuts costs in bulk dry yeast shipments**

SHIPMENTS of 1800-lb lots of bakers' active dry yeast now are underway using a newly developed reusable rubber container consisting of special mixtures of synthetic rubber compounds that have FDA approval for use with foods.

(Container, in its "food-grade" construction also has been independently tested and approved for handling sugar, flour, malt, coffee, wine, vinegar, lard, liquid chocolate and milk.)

Since the yeast is hermetically sealed in the container under nitrogen atmosphere, need for controlled temperature in shipment and storage is eliminated, and long storage stability for the product is assured. The unit also is moisture- and vermin-proof.

Another advantage is ready access to the product at the bakery. Suspended vertically by means of a metal loop at one end, it is unloaded, as

smart truck users choose

NationaLease
the PREFERRED way to lease trucks

**because it's national in experience and service – local in costs and controls**

NationaLease supplies everything but the driver at flexible, local-level costs. On-the-spot management provides highest efficiency; full service, one-invoice truckleasing—the LEASE-FOR-PROFIT way.

NationaLease service doesn't add to your cost . . . it saves. Saves the capital and management time you now spend on trucks so you can put yourself—and your money—back into your own business.

**Lease for Profit**

Lease a new Chevrolet, or other fine truck, operate it as your own with no investment, no up-keep.

For facts about full-service, "Lease-for-Profit" truckleasing — and the name of your local NationaLease firm, write

NATIONAL TRUCK LEASING SYSTEM
Serving Principal Cities of the United States, Canada, and Puerto Rico
23 E. JACKSON BLVD., SUITE: P-5 CHICAGO 4, ILL.

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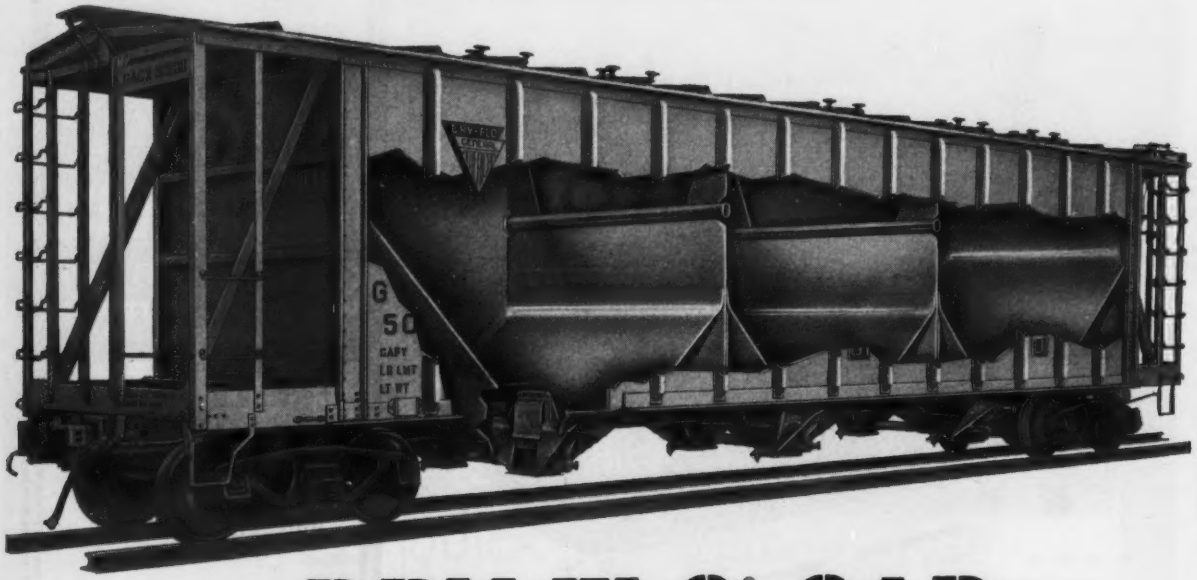
*Ship Chemicals, Food Stuffs, Feed Ingredients in bulk in the New*



# DRY-FLO® CAR

General American's new Dry-Flo car brings the economies of bulk shipment to many dry, granular or powdered products which otherwise require bags, drums or containers.

Competitive in price with ordinary covered-hopper cars, the Dry-Flo car keeps the lading contamination-free and seals it from the outside air.

The Dry-Flo car can be loaded easily and quickly by either pneumatic or mechanical systems. Rounded hopper corners and clean interior lines eliminate hang-up points, insure complete discharge of product. Interiors can be coated.

All this adds up to important savings for shippers.

Consult us about *your* shipping problems. If you make, buy or sell dry, granular products, chances are you will profit from shipping by Dry-Flo car.

**Patent Rights Reserved*

*IT PAYS TO PLAN WITH GENERAL AMERICAN*

Airslide® and Dry-Flo® Car Division
**GENERAL AMERICAN TRANSPORTATION CORPORATION**
*135 South LaSalle Street • Chicago 3, Illinois*
*Offices in principal cities*
*In Canada: Canadian General Transit Co., Ltd., Montreal*

DRY-FLO GENERAL AMERICAN TRADE MARK

7268 on Reader Service Slip.



required, through the other end.

Now used for shipments from the Belle Chasse, La., plant of Red Star Yeast and Products Co., Milwaukee,

At bakery, contents are emptied as needed into 300-lb fiber drums of type also used for bulk over-the-rail shipments

Wis., the new container is regarded as another step in the trend toward greater automation of commercial baking.

("Sealdtank" reusable rubber container, equipped with a food-grade liner and providing a hermetic seal, was adapted to use with active dry yeast in cooperation with Red Star Yeast and Products Company by United States Rubber Co., 1230 Ave. of the Americas, New York 20, N.Y.) 7269 on Reader Service Slip.

**Rerail wheels quickly under all conditions**

**Features:** In addition to apexed channel at critical head-point of universal-type car or engine replacer, side guard walls assist direction of stubborn trucks.

Clamping arrangement provides positive anchorage to rail, eliminating both forward and "kickback" travel of replacer, and retarding side tip-

*(Continued on page 116)*

***that's interesting***

**But what comes next?**

As *This Week* magazine sees it, the nation's dietary interests have passed from the carbohydrate era to the vitamin era, and now we're in the protein era.

Impressive sales evidence of this is reported by IGA Food Stores in their 1959 meat and fresh vegetable sales. IGA's vice president in charge of perishables, Glenn R. Curtis, says "beef sales in our stores in this country in 1959 showed an increase of 17 per cent over the 1958 period.

"Our fresh vegetables and other produce have been in such heavy demand that, at IGA headquarters, we no longer calculate their sales by the case — it's measured by the ton," he observes.

**Maybe it's just 'green thumb'**

"What makes your vegetables so green?" is question frequently asked of US personnel at foreign trade fairs where American frozen foods are on exhibit. Many viewers can't believe that a processed vegetable could have that color naturally, and suspect that we dye our peas.


"Truck maintenance like a bad dream?"

*Sleep soundly! Lease trucks from Hertz!*

NO UPKEEP... NO INVESTMENT

Stop worrying about the expensive tires, batteries, repair parts, painting, time and labor that go into keeping your truck fleet operating. Switch to Hertz Truck Lease Service and get new maintenance-free GMC, Chevrolet or other sturdy trucks, custom-engineered to fit your needs. Or, we'll buy your present trucks, rebuild them if necessary, and lease them back to you. Either way, Hertz experts take over all repairs and upkeep. Hertz will also provide extra trucks for peak periods or emergencies!

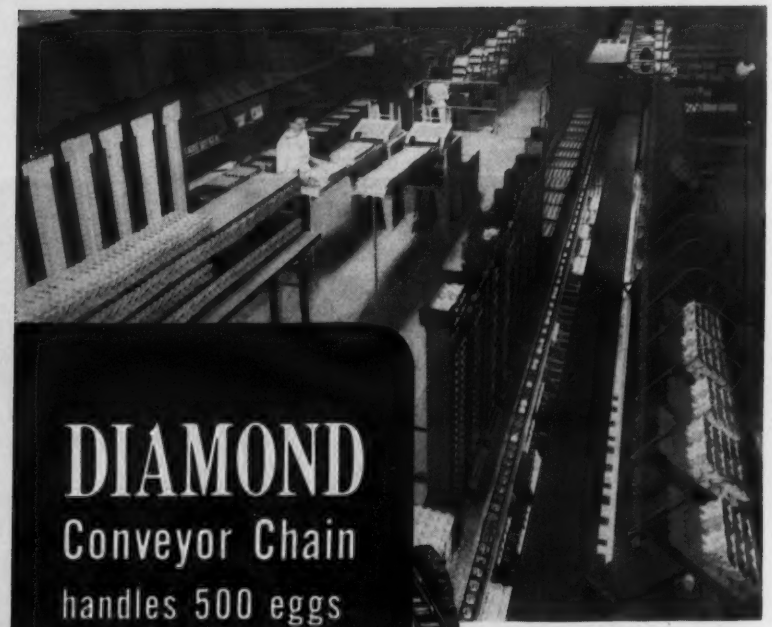
You eliminate all your truck problems by writing one budgetable check per week. There's no easier way to get out of the truck business and back into your own business! Rely on Hertz, America's No. 1 truck lessor, with over 500 stations in the U. S. and Canada.

HERTZ TRUCK LEASE®

*For more information, call your local Hertz office. Or write for the fact-filled booklet, "How to Get Out of the Truck Business," to Hertz Truck Lease, Dept. N5 218 South Wabash Avenue, Chicago 4, Illinois.*

In addition, Hertz also rents trucks by the hour, day or week.

7270 on Reader Service Slip.



# DIAMOND
## Conveyor Chain
handles 500 eggs per minute in
*fmc* Automatic Egg Handling System

FMC System utilizes electronic "brain" to weigh, record, code, count, treat, pack and date 30,000 eggs per hour. Actual egg handling is accomplished by DIAMOND Conveyor Chain equipped with special attachments and nylon egg cups.

◆ With split-second precision, DIAMOND Conveyor Chain receives, moves, positions *240,000 eggs during each eight hour shift.* It's a high-speed operation where a momentary foul-up could cause a king-sized omelette; where synchronization, timing and dependable, *trouble-free service* are absolutely essential. That's why Food Machinery and Chemical Corporation specifies DIAMOND Conveyor Chain for its electronically controlled Automatic Egg Handling System.

**DIAMOND CHAIN COMPANY, INC.**
*A Subsidiary of American Steel Foundries*
**Dept. 410, 402 Kentucky Avenue • Indianapolis 7, Indiana**

DIAMOND ROLLER CHAINS ®

Offices and Distributors in all Principal Cities

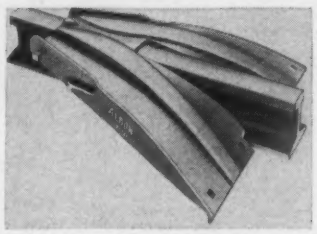
7271 on Reader Service Slip.




(*Continued from page* 114)

ping.

**Description:** Four sizes are available for rails from 12-45 lb, 45-70 lb, 70-100 lb and 100-155 lb, respectively. First two sizes, "C" and "D", are designed for industrial rolling stock, latter two, "E" and "H", for standard rolling stock.



Straddle-type car replacer positively channels wheel flange along gradual incline all the way to rail head

Any two universal replacers can be used on either side of track, and in either direction; any one can be used with any other odd-style replacer. One setting rerails wheels in crossed position. Device can be used regardless of roadbed condition.

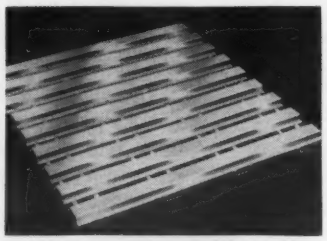
(Improved Universal Car Replacer is manufactured by The Aldon Co., 3338 Ravenswood Ave., Chicago 13, Ill.) 7272 on Reader Service Slip.

### Keep 'hot spots' cold in transit

**Features:** Aluminum racks for truck and trailer beds are designed to permit maximum cold air flow at all refrigeration levels, maintain even insulation between load and truck bed by allowing the cold air to flow freely.

**Description:** Lightweight, sanitary racks will not rust, rot, burn, warp or mildew, can be handled easily by one man. They are said to fit any size trailer.

(Aluminum Vent-A-Racks are manufactured by The Louisville Metal Products Co., 1101 W. Oak St., Louisville, Ky.) 7273 on Reader Service Slip.

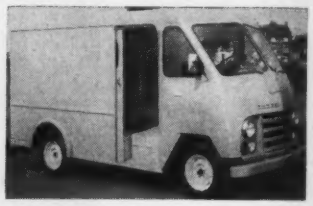


Racks prevent frozen food spoilage due to uneven in-transit temperatures

### ¾-ton payload for lightweight truck

**Uses:** For light- and medium-capacity multi-stop service in delivering such products as bakery foods, coffee and spices.

**Features:** Truck has 400 cu ft cargo area and gross vehicle weight of 7000 lb.



Delivery truck can be powered with either 80-hp or 114-hp engine

It is made with either steel or aluminum body. When aluminum construction is used, 400 lb are added to truck's payload.

**Description:** Both models of truck have steel-enclosed safety cab. Steel body is constructed with "speed panels" for quick repairs.

Trucks have 117½-in. wheelbase.

(Lite-Weight trucks are made by Divco-Wayne Corp., 2200 Hoover Road, Detroit, Mich.) 7274 on Reader Service Slip.

**Special opportunities for you in the Classified Advertising section, page 150**

**Automatically controls motor load, mash temperature for . . .**

# Optimum pellet milling

**System controls operation variables on two pellet mills for any feed formula**

**PROBLEM:** To avoid drawing excess current, and for other operating reasons, full capacity of pellet mill motors is seldom realized on a continuous basis.

Also, because operating temperature is often very close to critical temperature at which plugging occurs, mills frequently are operated at less than optimum temperatures. This, of course, results in reduced efficiency.

**Solution:** At McMillin Feed Mills, Division of Central Soya Company, Camp Hill, Pa., control system automatically maintains optimum motor-current load and temperature values.

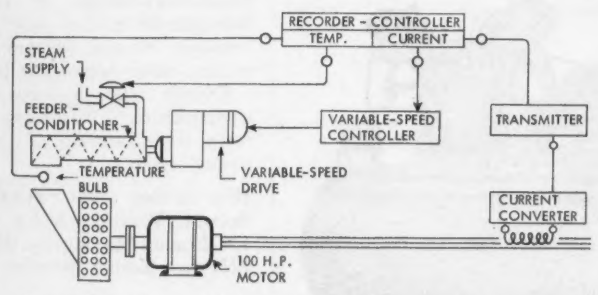
Operator sets current and temperature control values for feed formula to be pelleted on recorder-controller, then manually starts up mill. System requires no further attention from operator for balance of run.

Control system consists of two circuits, see diagram below. Motor-load current on pellet mill is measured and compared to pre-set value. If difference is over 2 per cent, control changes speed of feed screw in feeder-conditioner to increase or decrease amount of mash feeding to pellet die.

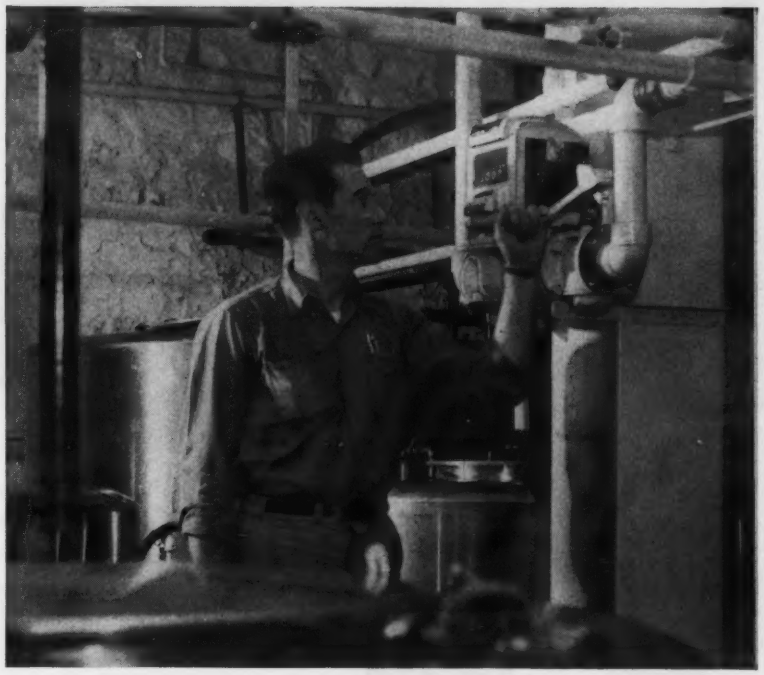
Second control circuit measures mash temperature before it enters mill. It compares this temperature to pre-set value, and if necessary adjusts steam flow to conditioner, thereby adjusting temperature of mash.

**Results:** Automatic control system readily handles operation of two mills on two eight-hour shifts for variety of feed formulas.

According to John Ebersole, manager of the Camp Hill Division, system could control 10 mills without difficulty under ideal operating conditions.




Current converter, coupled to current transformer, detects amount of current being drawn by pellet mill motor. Amperage value is relayed through transmitter to recorder-controller which records information and when necessary adjusts speed of feeder-conditioner. Temperature indicator located between feeder-conditioner and pellet mill relays temperature of mash to recorder-controller where it is recorded. Controller actuates steam valve to maintain constant, pre-set temperature

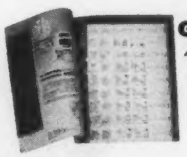
## What's behind the SKILL in Cointreau Liqueurs?

In the Flemington, N. J., plant where fine Cointreau cordials are made, craftsmanship is worth far more than time. For an extra touch of skill in controlling sweetness, Cointreau reached for an accurate Neptune meter . . . and made impressive savings of time, too!

Sweetness comes from pure cane sugar. Two men formerly were needed to unload and stack the bags. Another man operated the steam-jacketed dissolving kettle. Scale weighing was necessary, and there were always fractional bags of sugar left over, with problems of spillage and storage.

Cointreau now purchases *liquid* sugar . . . with a Neptune Auto-Stop meter for accurate measurement. The meter controls the quantity *automatically*. Each batch now takes only a few seconds of one man's time.

Want to improve quality . . . save time? Invariably Neptune meters do *both* . . . at a cost lower than you'd think. Find out today.



**GET THE FACTS**
*Ask for helpful Meter Data Bulletin 566 JFP. See Neptune Data Pages in Chemical Engineering Catalog.*

**NEPTUNE METER COMPANY**
19 West 50th Street • New York 20, N.Y.

neptune

Branches in:
ATLANTA • BOSTON
CHICAGO • DALLAS • DENVER
LOS ANGELES • LOUISVILLE
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PHILADELPHIA • PORTLAND, ORE.
SAN FRANCISCO (Millbrae)
IN CANADA: TORONTO 14, ONT.

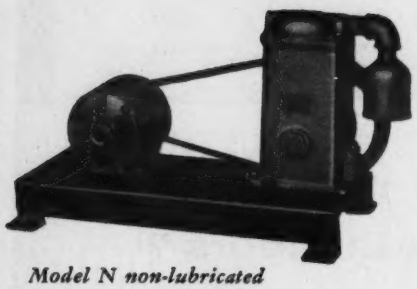
7275 on Reader Service Slip.

# is your compressed air problem an oily one?

If so, see the leading air compressor manufacturer —Ingersoll-Rand. For *oil free compressed air* applications in food, chemical, combustion or process control, packaging, laboratory work, etc., small I-R non-lubricated compressors may be the answer.

Ingersoll-Rand non-lubricated units feature pistons fitted with patented graphitic-carbon rings that prevent contact of the piston and cylinder bore. These segmented rings with metal expanders have the correct bearing pressure against the cylinder wall. Metal to metal contact is eliminated and no lubricant is required in the compressor cylinder. The crank case is lubricated but oil cannot pass the crosshead portion that is equipped with seals and oil control or scraper rings.

Why not have an experienced Ingersoll-Rand air engineer or distributor help you solve your problems.

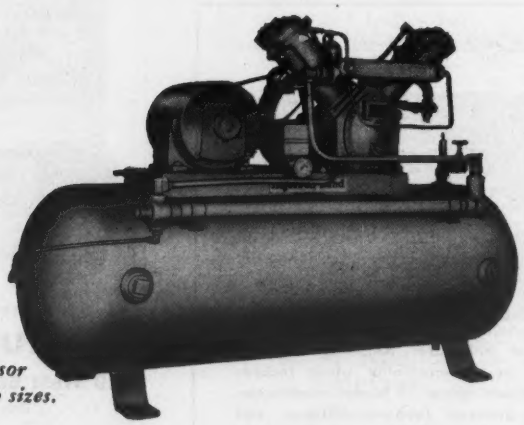


*Model N non-lubricated compressor available in ½, ¾ and 1 hp sizes.*

*Model 23ANL non-lubricated compressor available in ¾, 1 and 1½ hp sizes.*

**Ingersoll-Rand**

84A3 11 Broadway, New York 4, N. Y.



*Model 235HNL non-lubricated compressor available in 2 and 3 hp sizes.*

***Larger I-R Reciprocating Compressors are available in non-lubricated design.***

7276 on Reader Service Slip.




Since automated system operates mills at peak horsepower and ideal temperature, quality and production are consistently high.

**Control Circuits:** Motor control circuits are interlocked so that pellet mill motor must run before conditioner motor.

Load sensing is by two instant trip relays, one for low load and one for high load.

Should load drop suddenly from 100 per cent to no-load, indicating empty mash bin or bridging of mash, low-load relay opens stopping steam flow and causing conditioner to run at low speed.

If bridge should fall and mash start feeding again, slow conditioner speed prevents pellet mill from plugging. Steam flow will automatically start again and mill will bring itself back up to full-load operation.

When high-load relay trips, pellet mill is about to plug. To give mill an opportunity to clear itself of overload, conditioner and steam are stopped immediately. Pellet mill usually clears itself and runs empty until operator starts conditioner again.

Low-load relay is usually set to trip at about 10 to 15 per cent above motor no-load amperes, or between 50 to 55 amperes for a 100-hp, 440-V motor. High-load relay would then be set to trip at about 200 amps or 150 to 175 per cent of full-load amperes.

Third relay is contact-making ammeter. Its function is to increase or decrease speed of feeder-conditioner to maintain pre-set load on pellet mill between 96 and 100 per cent or any other reasonable limits.

Fourth relay controls mash temperature. Temperature bulb is in stream of conditioned mash.

(For further information, Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pa.) 7277 on Reader Service Slip.

**HELP YOURSELF . . . .**
For a quick reference to new technical literature available this month, see the classified listing on page 145.

***that's interesting***

**Martinis just not enough!**

Seeking newer uses for olives, W. V. Cruess, professor emeritus of food science and technology, University of California, has had some creamed olive soup canned experimentally and reports a "very favorable" consumer response.

Into the soup went the smaller olives, not suited because of their size to canning.

**Utah canners have it made**

Utah packers of canned food ought to be doing an excellent business right in their own inter-mountain region market in the future.

Population growth rate exceeds the nation as a whole and the population characteristics — high educational level and extensive home ownership—are social factors synonymous with high consumption of canned foods.

For more information on product at right, circle 7278 see information request blank opposite last page.


# Fairbanks Nº 1

*a scale, our first one.*
*an imagination of iron, brass, copper and lead,*
*fashioned in a New England workshop.*
*inanimate.*

*but it spoke—*
*a different kind of language,*
*of pounds and ounces and fractions thereof*
*and it spoke only the truth.*

*it felt—*
*the roundness of grain, the smoothness of marble,*
*the sweetness of candy and the authority of gold.*

*it heard—*
*the sound of life, babies newborn*
*it cradled them and recorded their growth*
*until pounds and ounces were replaced*
*by years and months.*

*it traveled—*
*by packet boat down the Mississippi,*
*by clipper ship to England,*
*The Sandwich Isles, the Indies,*
*South America and China.*
*better known throughout the world*
*than anything else made in America.*

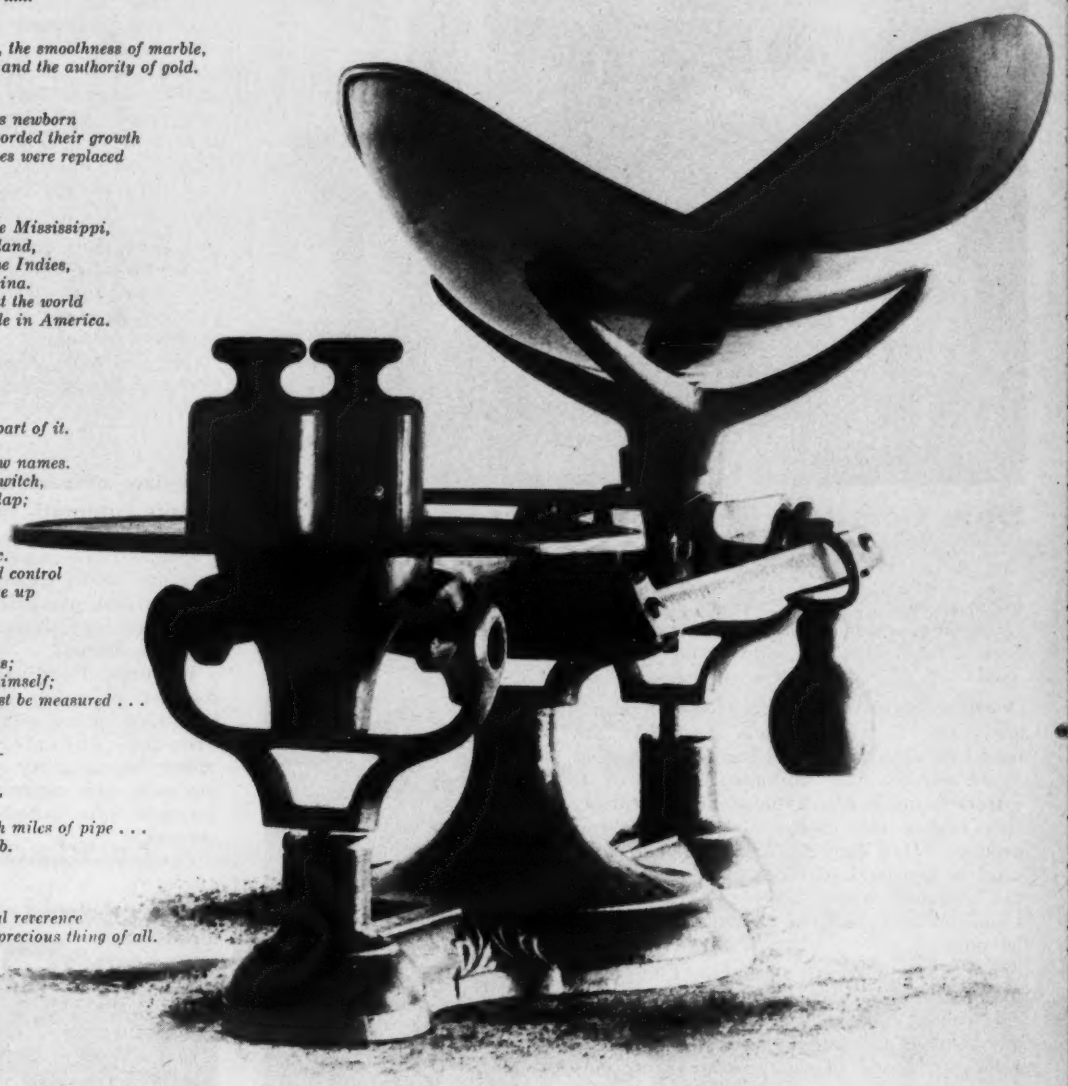
*it was relied on*
*by farmers, merchants,*
*scientists and doctors.*
*it witnessed history;*
*influenced it and was part of it.*

*its descendants have new names.*
*floaxial dial, mercoid switch,*
*reed switch and cotton lap;*
*remote control,*
*printomatic,*
*electronic and levetronic.*
*all serve to evaluate and control*
*the substances that make up*
*the universe.*

*raw materials*
*or manufactured articles;*
*things unseen or man himself;*
*all have weight and must be measured . . .*
*our scales do the job.*

*and the new challenge—*
*weight in motion . . .*
*freight trains in transit,*
*trucks too busy to stop,*
*liquids coursing through miles of pipe . . .*
*our scales will do the job.*

*but this was our first—*
*Fairbanks No. 1*
*and we hold it in special reverence*
*for it weighed the most precious thing of all.*
*it weighed an idea.*



# Fairbanks, Morse

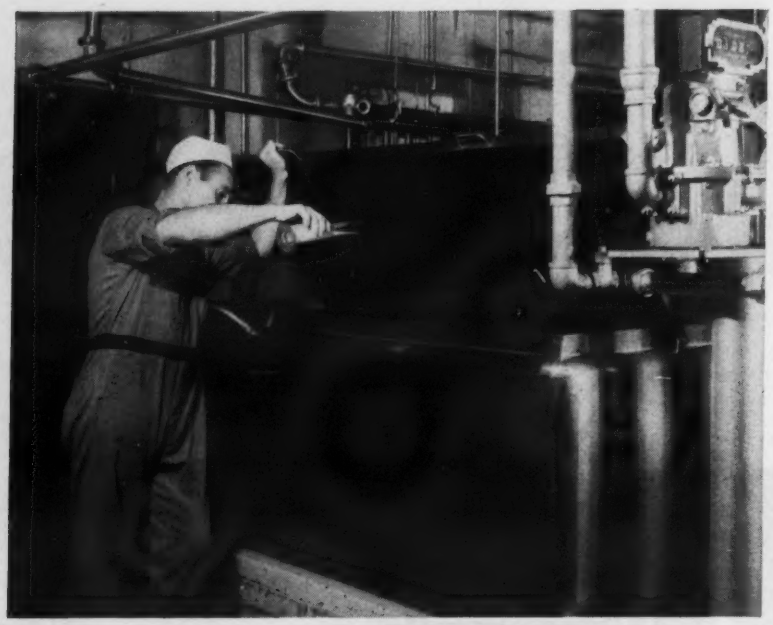
A MAJOR INDUSTRIAL COMPONENT OF FAIRBANKS WHITNEY CORPORATION, NEW YORK

**Scales for heavy industry and for business; scales for science and for the home. Scales that weigh milligrams or millions of pounds. Scales that weigh missile fuel loads at Cape Canaveral; trucks on the Golden Gate Bridge; onions at your neighborhood grocer's . . . we make every kind of scale for every kind of purpose, including electronic scales. We are the Number 1 manufacturer of scales and automated weighing systems in the world.**

**If you have a problem where the careful calculation of weight is of vital importance, please write to Mr. Robert W. Kerr, President, Fairbanks, Morse & Co., 600 So. Michigan Ave., Chicago 5, Illinois.**

**SILICONE NEWS from Dow Corning**

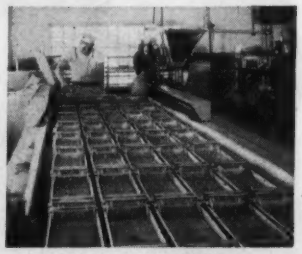
# Prevent Costly Foam



## Dow Corning Silicone Defoamers Reduce Waste, Increase Capacity

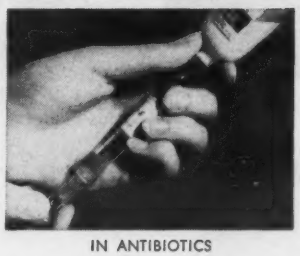
Foam is costly . . . it takes up production space, slows down processing, causes maintenance problems—may even create a fire hazard! You can control foam once and for all with the most effective antifoams ever developed: Dow Corning silicone defoamers.

Odorless, tasteless, and physiologically harmless, Dow Corning silicone defoamers are used extensively in processing and packaging foods, syrups, and antibiotics. Effective at extremely low concentrations and safe to use, they neither alter nor contaminate the end product. Dow Corning Antifoam A may be used in nonstandard foods at concentrations to 10 ppm; water-dilutable Antifoam AF Emulsion may be used at concentrations to 34 ppm.



IN FREEZING MIXES

A typical application: in making Fudgsicles, foaming of milk, chocolate and other ingredients caused numerous rejects of frozen bars and also cut production space. Antifoam AF Emulsion added to the processing prevents foam . . . helps keep production up and costs down.



IN ANTIBIOTICS

Write for a FREE SAMPLE giving an indication of your foaming problem and whether it's in an aqueous or oil system. Address Dept. 5705.

first in silicones

**Dow Corning CORPORATION**
MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

7279 on Reader Service Slip.

*instrumentation*

### Regulate solids flow into storage

Self-contained units have pendant floats which operate enclosed switches. Mounted in tanks or bins, level-controls will start or stop feed conveyors or elevators as levels rise and fall.

Switches are made in three styles: normal-duty, explosion-proof and heavy-duty. Details of each model, as well as pictures and diagrams are presented in four-page bulletin.

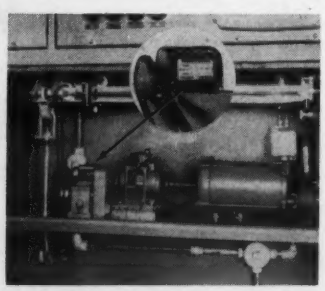
("Tellevel Bin Level Control Switches," Bulletin 159, may be obtained by writing Stephens-Adamson Mfg. Co., Standard Products Division, Ridgeway Ave., Aurora, Ill.) 7280 on Reader Service Slip.

### Totalizes amount fed, checks automatic feeder

**Uses:** For continuously feeding and weighing (in pounds) any pulverized, granulated, stringy, lumpy or cohesive material.

**Features:** Relatively simple method of using a counter furnishes positive record of over-and underfeed. Unit, which has accuracy of ½ of 1 per cent, uses counter in conjunction with automatic flow control.

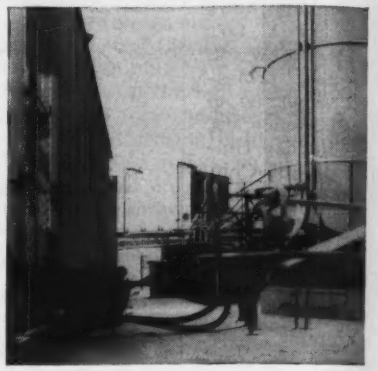
Counter records number of turns a lead screw has made; thus, exact amount of material that has been fed for each setting can be found to cor-



Counter is driven from lead screw which has known weight per revolution through chain and sprocket drive to record the weight of material being discharged from feeder

***Problem:***

**To cut costs and gain floor space in flour handling operations**



***Solution:***

**SPROUT-WALDRON**
**PNEUMATIC SYSTEM**

In addition to the standard savings of 12¢ per bag which automatically applies when you shift from bag to bulk flour, Chef Boy-Ar-Dee, Milton, Penn., gained these advantages with the Sprout-Waldron pneumatic system:

1. Faster handling
2. Lower operating costs
3. Simplified maintenance
4. 10,000 square feet of floor area
5. Improved housekeeping

The system picks up from rail cars and delivers the flour to storage at rates of 20 tons per hour. It then transfers it 600-700 ft. to plant bins at rates of 6000 pounds per hour. Heat exchangers incorporated in the system keep the flour at proper blending temperature at all times.

For the full story of savings at Chef Boy-Ar-Dee request Bulletin 1-54.

CW/108

SW **SPROUT-WALDRON**
Muncy, Pennsylvania

Size Reduction • Size Classification • Mixing
Bulk Materials Handling • Pelleting

7281 on Reader Service Slip.

rect for any degree of over or underfeed.

Wide range of units provide capacities from 1 to 60,000 lb/hr and ranges up to 50-1.

**Operation:** Flow of material from hopper, which contains several hours supply, is controlled by feeder through a dead-weight system. Hopper is mounted on a scale lever system and is counterbalanced by a scale beam and traveling counterpoise.

A lead screw, rotated by a constant-speed motor retracts counterpoise along scale beam at a rate proportional to rate of feed. Thus, materials are metered accurately to formulate any desired blend.

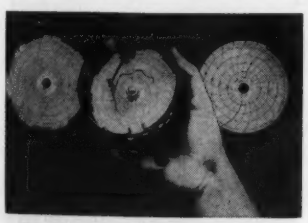
(Continuous Loss-in-Weight Gravimetric Feeder is manufactured by B-I-F Industries, Omega Division, 345 Harris Ave., Providence 1, R.I.)
7416 on Reader Service Slip.

(Counters are made by Durant Manufacturing Company, 1951 N. Buffum St., Milwaukee 1, Wisconsin.
7282 on Reader Service Slip.

### Compact, portable recording thermometer

Dry stylus writes in any position

**Uses-Features:** For truck, train, ship or airplane as well as for temporary or permanent service in freezers, coolers, drying sheds and ovens.



Portable recording thermometer can be readily packed with product to be shipped since it is small and weighs only 14 oz

For recording temperatures in wet environments or in liquids, instrument may be incased in thin polyethylene bag.

Recorder uses dry scribe; has therefore no ink to spill,

One of 38 Foxboro Cam-Set Schedule Controllers used to control temperature of fermenting tanks at the Pabst Brewery, Newark, New Jersey.

## Foxboro Cam-Set Schedule Controllers protect the uniformity of Pabst Blue-Ribbon Beer

Ever wonder how they do it? Make every bottle of Pabst taste the same, look the same . . . batch after batch after batch. Experienced brewmasters — special yeasts are part of the answer. And strict control over time and temperature of fermentation are the rest.

For this strict control, Pabst Brewing Company, Newark, New Jersey, depends on Foxboro Cam-Set Schedule Controllers.

Here's how they do it. Operator installs proper cam for fermenting cycle, sets controller at "start," and that's it. Then, Foxboro takes over — automatically advancing tank temperature; automatically circulating refrigerant through tank coils when temperature of fermenting wort starts to rise. And when the cycle is complete, the operator has a continuous chart record of the whole process.

Foxboro Cam-Set Program Controllers deliver perfect uniformity, perfect repeatability, batch after batch. No wonder every bottle of Pabst tastes and looks the same.

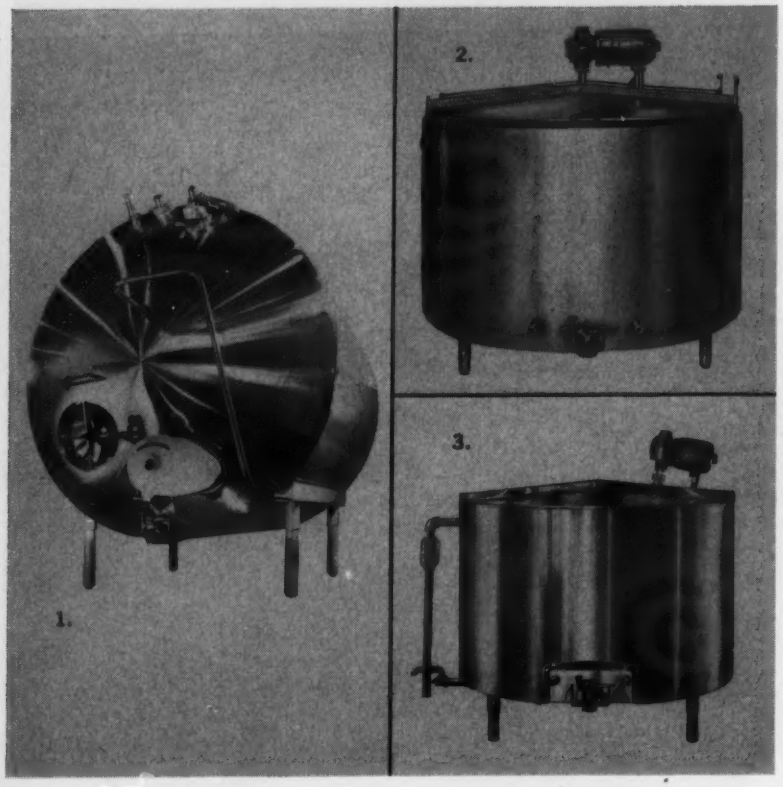
If continuous temperature control is a problem on your food process ask your Foxboro field engineer about the Cam-Set Controller. Or write for engineering data sheet 208-3. The Foxboro Company, 925 Neponset Avenue, Foxboro, Mass.

Two-case Foxboro Cam-Set Schedule Controllers are used on mesh and cereal cookers at the Pabst Brewery. Two-case instrument allows changing charts without touching the cam.

FOXBORO
REG. U.S. PAT. OFF.

7283 on Reader Service Slip.

# FLUIDICS* AT WORK




## Three ways to increase efficiency in dairy and food processing

For storage, processing, or pasteurizing you'll find a line of Pfaudler® equipment to help you do the job efficiently.

**1. Storage.** More milk is stored in Pfaudler-built tanks than in any other make—with good reason. Every tank is made to 3-A sanitation standards. Construction of wall cooler sections for ammonia, freon or chilled water is ASME approved. Choose from cylindricals or rectangulars in 600 to 8000 gallon capacities — if you need more capacity, we can provide it in the 10- to 20,000 gallon range. Often you can "stretch" cramped floor space with our rectangular tank design.

**2. Pressure Process Vats.** In any size, from 100 to 1000 gallons, you get effective heating or cooling of any fluid product, plus mixing, blending, and holding. Run full or partial batches. Pressurizing jacket, where appropriate, cuts process time. You can also specify *vacuum-pressure* vats for removing unwanted tastes and odors during processing.

**3. Mixer-Pasteurizer.** Here's the way to thorough blending of additives including powders, frozen cream and butter. Proper agitation assures you of no "lumping." Heat-up is fast. Select capacities from 150 to 1000 gallons, in stainless steel.

For complete information on any of these products, write to our Pfaudler Div., Dept. FP-50, Rochester 3, N.Y.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

**PFAUDLER PERMUTIT INC.**
Specialists in FLUIDICS...the science of fluid processes

7284 on Reader Service Slip.




freeze or run.

**Description:** Recording thermometer is made in two temperature ranges: from 20 to 220 F and −40 to 160 F. Two time ranges available are for 24-hour or 7-day duration. Clock movement is by spring.

Recorder is only 3 15/16 in. in diameter by 2⅞ in. high. It uses a chart of 3⅜ in. diameter.

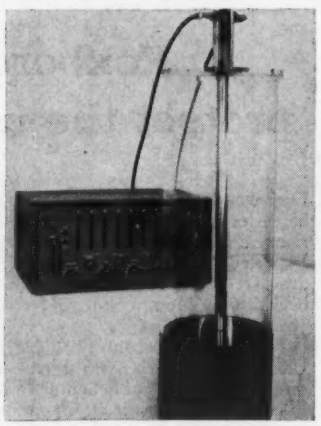
(Dry stylus recording thermometer is made by Pacific Transducer Corp., 11836 W. Pico Blvd., Los Angeles 64, Calif.)
7285 on Reader Service Slip.

### Measures liquid levels precisely, continuously

Is unaffected by wide temp variation, corrosive environment

**Uses:** System should find application in level control where corrosion and high humidity have been a problem; should be useful with such products as vinegar, oil, water, fermented liquors and syrups.

**Features:** Fully transistorized measuring system has either digital or continuous output which can be adapted to proportioning and blending, recording and controlling.



Liquid level system measures depth to 5 or 15 ft

Since system has no moving parts or currents in liquids which it measures, its accuracy is not materially affected by characteristics of fluid.

**Operation-Description:** Gauge essentially consists of two wave guides, half inch apart, mounted in 2-in. SS tube. On top of each wave guide is a hermetically-sealed transducer head.

Pulse of a few microseconds duration is applied to transmitting transducer.

Pulse travels down transmitting wave guide to liquid surface where some of its energy radiates laterally into liquid. Reaching close-by receiving wave guide, pulse of elastic wave energy travels up to receiver transducer.

Time of transmission accurately measures distance from transducers to liquid surface.

(Metasonic Continuous Liquid Level Measurement is a development of The General Ultrasonics Company, 6 Tobey Road, Bloomfield, Conn.)
7286 on Reader Service Slip.

### From −40 to 200 F indicating pyrometer

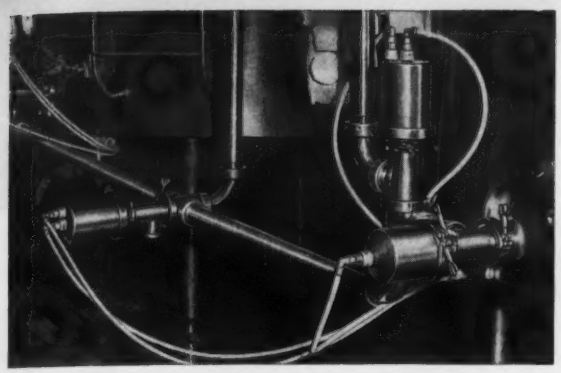
6 thermocouples available for variety of applications

**Uses:** For measuring temperatures in relatively low range on surface or in immersion applications.

**Features:** Portable instrument has two ranges: from −40 to 120 F and from 50 to 200 F. Scales are calibrated to one degree.

Thermocouple wires are approximately four ft in length and are readily connected to pyrometer

For setting reference tem-



# NEW TAYLOR SANITARY VALVES

## for Product Handling and CIP

THE LATEST Taylor development for vegetable and citrus juices and other food processing applications and Cleaned-in-Place features:

**Polished stainless steel** construction for corrosion resistant operation.

**Smooth contour design** of valve ports and plunger to eliminate grooves, make CIP possible.

**Positive shut-off** because Disc and O-ring seals are made of a special synthetic rubber compound—odorless, tasteless and unaffected by product or cleaning solutions.

**Interchangeable valve types** because of unit body construction.

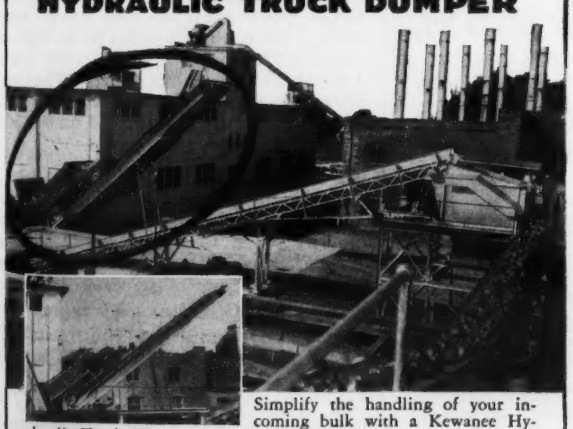
**Numerous end-connections** available at no extra charge.

See your Taylor Field Engineer, or write for **Bulletin 98296.** Taylor Instrument Companies, Rochester, N.Y., or Toronto, Ont.

*Taylor Instruments* MEAN ACCURACY FIRST

7287 on Reader Service Slip.

**SUGAR BEETS—**
**UNLOADED BY A— Kewanee**
**HYDRAULIC TRUCK DUMPER**



Simplify the handling of your incoming bulk with a Kewanee Hydraulic Truck Dumper. Above photo shows a 50 x 10′ Kewanee unloading sugar beets in a midwestern sugar refinery.

Kewanee's cut costs by enabling you to systemize your flow of material. They are used for dumping any free-flowing material, viz.: Grain, Cotton Seed, Wood Pulp Chips, Chemicals, Glass Cullet, Limestone, Clays, Cabbage, Fruits and numerous other products. Available in sizes to accommodate all trucks or tractor-trailers.

*Write today for Engineering Data*

**SCREW CONVEYOR CORPORATION**

701 Hoffman Street • Hammond, Indiana
Winona, Mississippi • Santa Clara, Calif.
Tampa, Fla. • Hackensack, N.J. • Memphis, Tenn. • Dallas, Tex.

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perature, cold-junction temperature is read from thermometer mounted immediately beneath scales.

**Description:** Pyrometer is enclosed in 7½ in. by 9 in. by 5 in. case and has electric dampening circuit.

Thermocouple attachments include one model for measuring surface temperature and another for measuring air temperature. There are also needle, hypodermic needle, rigid immersion and flexible-wire thermocouples.

Pyrometer and thermocouples are illustrated and described in detail in four-page bulletin.

("Pyrometer for measuring low temperatures," Bulletin 2146-C, is available from Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago 10, Illinois.)

7289 on Reader Service Slip.

### Automates formulation of multi-ingredient products

**Bulk-material system has accuracy of ± 0.25 per cent**

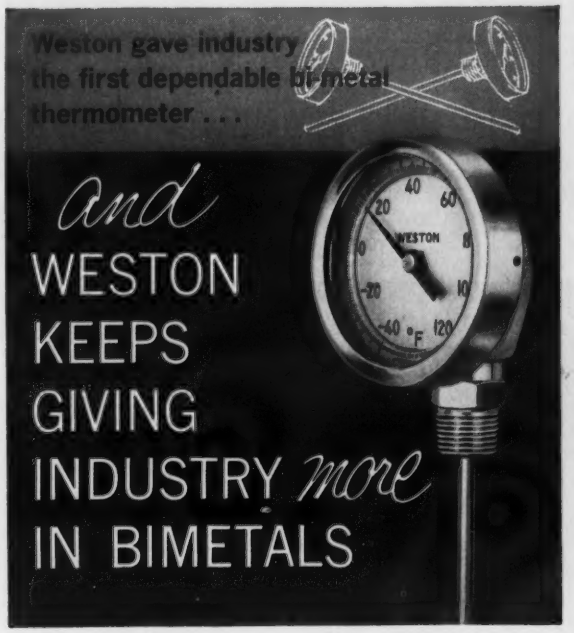
**Uses:** For batch-weighing two, three, four or more ingredients in programmed sequence to any desired proportion.

**Features:** System has weighing accuracy of ¼ of 1 per cent of calibrated range and has reproducibility better than one part in 2000.

Operation is completely automatic once system assignments have been programmed.

Design of system uses unitized, pre-engineered components such as feed and discharge devices, weigh hoppers and weight transmitters, which can be interchanged with "building block" simplicity. Therefore, plant installation is very flexible and construction of a job-matched system is without complications.

**Description:** Standard read-out and control facilities for each ingredient include net-weight indication, batch-weight set, tare adjustment and hopper fill and discharge signalling. Also included is control-method selection


Yes, Weston gives you more: the broadest line—from which you can choose thermometers exactly suited to your process . . . more of the features you want – for convenience, readability, accuracy and long service . . . more quality—in the famous Weston tradition of fine craftsmanship.

- **All stainless steel construction, including welds**
- **In-line scales and pointers eliminate parallax errors**
- **External adjustment feature located at side of instrument provided as standard equipment**
- **Removable bezels for easy window replacement in the field**
- **Advanced gasket material to protect against "breathing" and leakage . . . even under extreme outdoor environmental conditions and low temperature measurement service without fogging or freeze-up!**
- **Guaranteed accuracies within 1% of range over entire scale**
- **Full line of sizes, stem lengths and ranges in back and bottom-connected models**

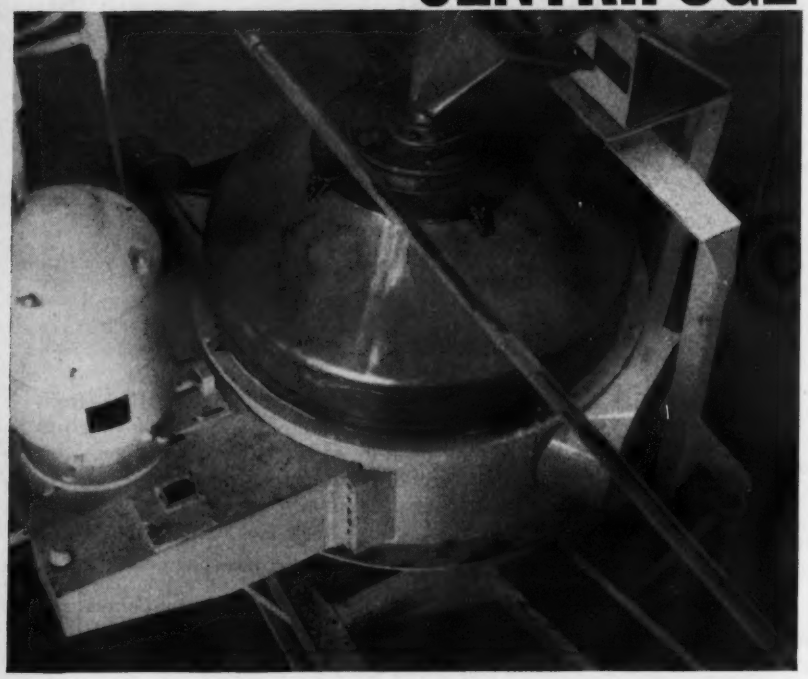
For full information and name of stocking distributor, contact your local Weston representative . . . or write to Weston Instruments Division, Daystrom, Incorporated, Newark 12, N. J. *In Canada: Daystrom Ltd., 840 Caledonia Rd., Toronto 19, Ont. Export: Daystrom's International Sales Division, 100 Empire St., Newark 12, N. J.*

**DAYSTROM, INCORPORATED**
WESTON INSTRUMENTS DIVISION
*World leader in measurement and control*

7290 on Reader Service Slip.

*Sebastopol Cooperative Cannery cuts processing time, scores new apple juice sales hit . . . with*

# MERCONE SCREENING CENTRIFUGE



Modernizing its processing system with Mercone® Screening Centrifuge and Oliver Precoat Filter has enabled the Sebastopol Cooperative Cannery of California to introduce a new, distinctively flavored apple juice. Trade-marked Apple Time, it is already a sales hit.

Key to this success is the continuous, automatic separation of pomace and juice from the pulverized apples made possible by the Mercone Screening Centrifuge. Subsequent filtering through an Oliver Vacuum Precoat Filter results in a clear, full-flavored juice, ready for pasteurization and canning. The new process eliminates the loss of volatile flavor involved in the old, time-consuming press and rack methods. Processing takes minutes from whole apples to canned juice. Problems of constantly cleaning racks and presses are also avoided, with a consequent saving of labor.

The Mercone Screening Centrifuge is a compact, completely enclosed, sanitary unit that is adaptable for juice extraction from a wide variety of fruit and vegetable pulps. For more information on its applicability to your particular problems, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

DORR-OLIVER

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

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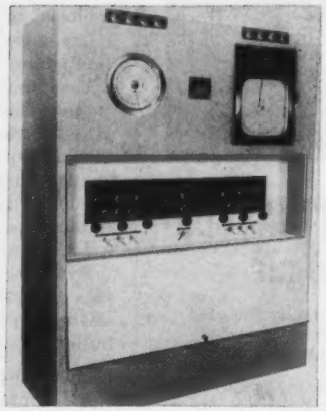
*instrumentation*

which may be manual, automatic or semi-automatic.

Optional equipment for



Control panel for six-ingredient batch-weighing system. Signal lights indicate sequence of operations for each ingredient

readout instrumentation includes batch-weighing recorders—either strip or round charts—punched tape printers, digital printers and other devices.

(Detailed information on W-C Multi-Ingredient Batch-Weighing Systems may be obtained from Weighing & Control Components, Inc., 656 E. County Line Road, Hatboro, Pennsylvania.)

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### From −50 to 1200 F, remote indicating controller

Remote-bulb indicating temperature controller can either open or close circuit on temperature rise. Point and temperature indication are readily visible through magnifying windows. Set point is adjusted by external knob.

Two-page data sheet describes unit, lists specifications and shows approximate dimensions in illustration.

("T654A Indicating Temperature Controller," Specification Sheet S 1010-7, may be obtained by writing Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., South, Minneapolis 8, Minn.)

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SARCO

## Here are 7 Sound Reasons Why the Thermo-Dynamic® Does a Better Job of Trapping

1. *Simplicity*—has only one moving part. 2. *Maintenance*—practically zero. 3. *Wide pressure range*—one trap for all pressures from 10 to 600 psi. 4. *Uniform performance*—operates equally well on heavy, light, or no condensate load. 5. *Operates against back pressures*—up to 50% of inlet pressure. 6. *Rugged*—unaffected by superheat, water hammer, vibration, or corrosive condensate. 7. *Minimizes inventory* of spare parts.

**Maintenance Time: 40 Seconds.** If it now takes your maintenance crew more than a couple of minutes to service an ordinary trap, you're throwing away valuable time. This Sarco Thermo-Dynamic can be cleaned, blown out if necessary, and reassembled on the line in as little as 40 seconds.

**For Prompt Information on the TD-50**... or for fast help on the efficient solution of any steam trapping problems, get in touch with a SARCO District Office, Sales Representative, or Distributor. (There's one near you.)

Only SARCO makes all 5 types:
Thermo-Dynamic* • Thermostatic • Liquid Expansion • Float Thermostatic • Inverted Bucket

*U.S. Pat. No. 2,817,353 TM Reg. U.S. Pat. Off.

SARCO COMPANY, INC.
635 Madison Ave., New York 22, N.Y.

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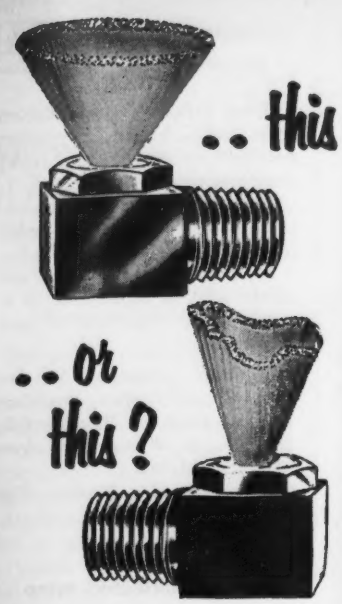


BE SURE OF A PERFECT CONICAL SHAPE SPRAY ALL THE TIME WITH *Monarch*

For a perfect spray, many food processing plants prefer Monarch nozzles.

This advanced design nozzle reduces clogging and guarantees dependable food processing applications to . . .

- WAX FRUITS
- RINSE VEGETABLES
- POWDER MILK
- DRY EGGS
- WASH FILTER CAKE
- HUMIDIFY BANANA ROOMS

*Send for Catalog 1*

Monarch
MFG. WORKS, INC.
3401 GAUL STREET
PHILADELPHIA 34, PA.

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### Measures temperatures precisely

Resistance-bulb temperature controller brings high degree of accuracy to non-indicating controls. Its differential is less than 1 F in lower ranges, proportionally narrow in upper ranges.

Useful in heating, cooling or heating-cooling operations, instrument has range from −100 F to + 1380 F in liquid or air.

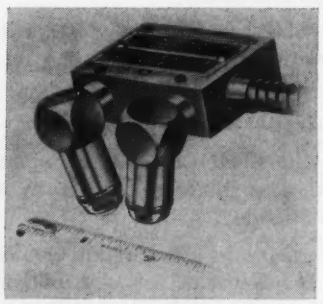
Economic, electronic unit is fully transistorized and is vibration resistant. It needs no field adjustment or calibration. Ambient temperature limits of instrument are 20 F to 125 F.

Features of controller are presented in two-page literature which also illustrates applications.

("R7082 Versa-Tran Temperature Controller" is available from Minneapolis-Honeywell Regulator Co., Industrial Controls Division-118, 2753 Fourth Avenue South, Minneapolis 8, Minn.)
7296 on Reader Service Slip.

### Complete, reflector-type photoelectric control in miniature

**Uses-Features:** Controls for adjusting light sensitivity and photo sensitivity of pickup are contained in relay amplifier; thus relay can be set to act at any desired level of reflected light.



Small size of unit makes for easy installation in small space

This feature of combination relay-pickup makes it useful in inspecting, counting, con-

Save up to ⅓ on the cost of your next conveyor...new handbook shows how

**Tells how to cut planning and installation costs with pre-engineered, ready-built conveyor components for immediate or future handling needs**

Install a conveyor system to meet your specific materials handling needs today . . . tomorrow . . . or in years to come. Using Standard's Handidrive handbook, simply order pre-engineered, prebuilt interchangeable conveyor components to which additions or alterations can be made as required.

"Do-it-yourself" buyer-users will find Handidrive assembly is fast, easy. The pre-engineered stock units include: roller conveyors (either gravity push-along or live roller type), inclined belt conveyors, drive units, intermediate sections, curved sections, supports, hangers and other miscellaneous items.

Lower initial cost — you buy only what you need — is only one of many Handidrive "off-the-shelf" benefits. The Handidrive handbook gives full details! Get your copy now . . . free of charge, of course.

3 plans to help you select and order simplified HANDIDRIVE pre-engineered units

**"Do-It-Yourself" Plan** — Determine your conveyor requirements, then select stock units from Handidrive handbook.

**"Recommendations-Requested" Plan** — On your request, a Standard specialist will advise you on installation of a custom-tailored Handidrive conveyor

**"Leave-It-All-To-Standard" Plan** — Standard's staff of experienced engineers will work out your handling problems of a more complex nature.

STANDARD
GRAVITY & POWER CONVEYORS
*Sales and Service in Principal Cities*
OVER 50 YEARS
of conveyor experience

STANDARD CONVEYOR CO.
North St. Paul 9, Minn., Dept. Q-5,
Please send me a free copy of your new Handidrive handbook.

Name.....
Company.....
Address.....
City.....Zone.....State.....

7297 on Reader Service Slip.

trolling difference in reflected light and in differentiating between acceptable and reject conditions.

**Description:** Self-contained pickup unit is compact; measures 1¾ by 2½ by 2¾ inches.

Position of light source and photo unit is adjustable as to angle and reflection of spot distance.

(Reflector pickups, Model RFU-7, and relay amplifiers are products of Photomation, Inc., 96 S. Washington Ave., Bergenfield, N.J.)
7299 on Reader Service Slip.

### Maintains selected temp at remote locations

For remote control of temperature in cooling or heating applications of gases or liquids, system consists of transmitter and receiver-controller.

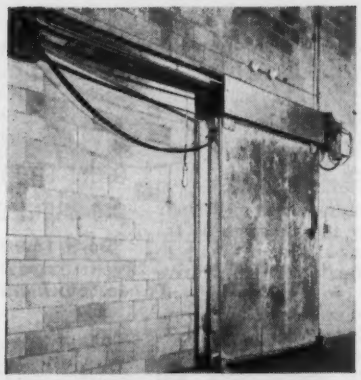
Transmitter translates temperature measurement from remote location into low-pressure air signal. Signal may be sent to receiver gauge for continuous temperature indication or to receiver-controller.

Receiver-controller compares transmitted air signal with its set point and adjusts control pressure to maintain desired temperature. Set point is manually adjusted by outside knob.

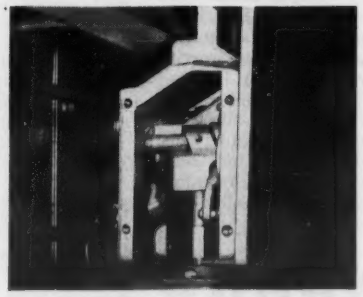
System of transmitter and receiver-controller is described and illustrated in four-page bulletin. Various applications are illustrated and temperature ranges are listed.

("Transmitter Receiver System," Bulletin 371, is available from The Powers Regulator Company, 3469 Oakton St., Skokie, Ill.)
7300 on Reader Service Slip.

For more information on developments described here, use the convenient self-mailing Reader Service Slip.



FAST OPERATION of Electroglide Freezer Door saves refrigeration. Note Jamison Frostop® installed to prevent icing and freezing.



POSITIVE SEAL. When door reaches closed position, exclusive Jamison camming action forces door *in* and *down*.

Photos Courtesy: National Tea Company, Council Oak Stores, Sioux City, Iowa
Insulator: Low Temp Insulations, Omaha, Nebraska

## In-and-out freezer room traffic speeded up by Jamison Electroglide® Doors

The efficiency and economy of Jamison's new Electroglide Power Operated Door are assured by special Electroglide features—available in no other door.

RANGE OF TYPES—Available as bi-parting and single leaf right or left hand.

LEVEL RIDE—Door opens and closes without gasket drag or wear.

SAFETY—Full height safety edge reverses door instantly on contact.

EMERGENCY CONTROLS—Manual operation when power off; emergency release from inside when padlocked outside.

Get the complete story on Electroglide Cooler and Freezer Doors. Write today for new bulletin to Jamison Cold Storage Door Co., Hagerstown, Md.

**JAMISON**
COLD STORAGE DOORS

7298 on Reader Service Slip.

fp **QUALITY CONTROL**

## Determine True Volume of Any Solids Without Using Liquids

**Provides means to measure specific gravity, density without affecting sample**

Instrument determines true volume as well as density, specific gravity or porosity of solid materials whether porous, granular, powdery or irregular in form, without using liquids.

Designed for field, laboratory or plant use, instrument is based upon the principle that two closed systems of air at the same pressure and temperature will have identical specific volumes.

As shown in diagram, sample is simply inserted in chamber "A" and piston in cylinders "A" and "B" are stroked from positions 1 to 2.

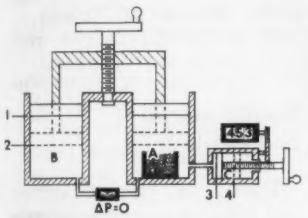
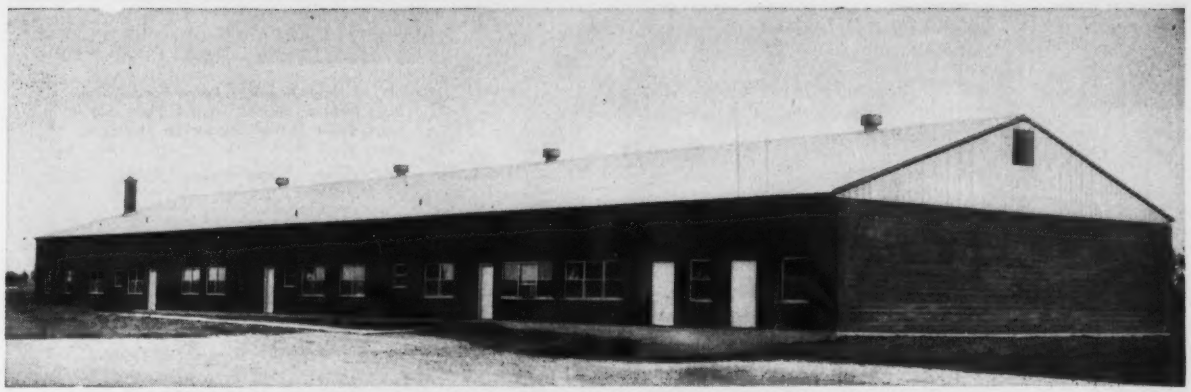



Diagram of instrument shows two identical equal volume chambers "A" and "B", stroked by pistons through a fixed distance. A third cylinder, "C", is connected to cylinder "A", and has a calibrated stroke so that for any movement of its piston, a counter registers the proportionate volume displaced

This creates an unequal pressure between the two cylinders due to the difference in volume caused by the sample. Cylinder "C" is then stroked until the pressure is equalized between "A" and "B". The volume stroked by cylinder "C" equalizes the two cylinder pressures "A" and "B". Added volume in "C" (from position 3 to 4 on diagram) is exactly proportional to the unknown volume of the sample. This volume is then read directly on the counter.

Since only air is present in

(Above) Dundas Producers Ltd., Dundas, Ontario, processes 1800 birds per hour.
(Below) Butler's clear-span design gives this plant an ideal flow plan.

These modern Butler processing plants cost less than you'd think!

A Butler Building is a "natural" for modern, straight-line processing. You'll erect a far superior building, increase your plant capacity, efficiency, and meet USDA inspection law requirements. And you'll do it for less money, too.

You see, Butler pre-engineered buildings are half-finished before you sign the order. Initial planning and engineering time and investment are minimized. Components go up in record time. You'll get into your new plant—and get into production—weeks to months sooner.

Butler's clear-span interiors—up to 120' wide—provide the unobstructed floor and overhead space you need for straight-line flow of materials. This post-free and truss-free design allows you to install overhead conveyors with complete freedom. And economical partitions can be used to separate receiving, killing, and eviscerating areas of the building.

Butler metal roof and wall panels are easy to clean, require virtually no maintenance. Precision-fabricated to fit tightly, they seal out weather, vermin, and rodents. Excellent ventilation, illumination, and climate control are "built-in" features of Butler Buildings.

For the full story on Butler buildings, call your nearby Butler Builder. Ask about Butler financing, too. He's listed in the Yellow Pages under "Buildings" or "Steel Buildings." Or write direct.

BUTLER

**BUTLER MANUFACTURING COMPANY**

7479 East 13th Street, Kansas City 26, Missouri

Manufacturers of Metal Buildings • Equipment for Farming, Oil Transportation, Outdoor Advertising • Contract Manufacturing

Sales offices in Los Angeles and Richmond, Calif. • Houston, Tex. • Birmingham, Ala. • Kansas City, Mo. • Minneapolis, Minn. • Chicago, Ill. • Detroit, Mich. • Cleveland, Ohio • Pittsburgh, Pa. • New York City and Syracuse, N.Y. • Boston, Mass. • Washington, D.C. • Burlington, Ontario, Canada

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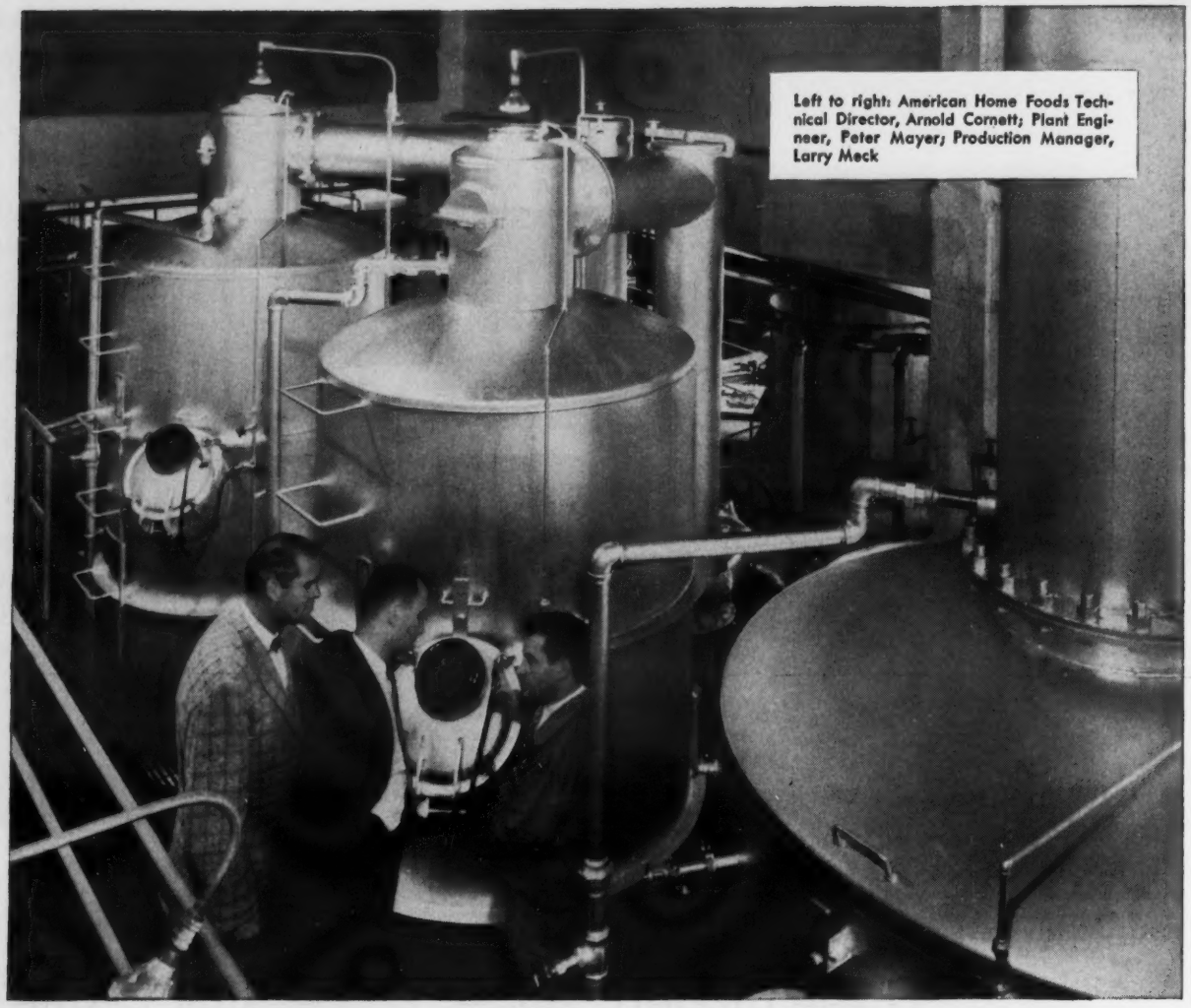

Left to right: American Home Foods Technical Director, Arnold Cornett; Plant Engineer, Peter Mayer; Production Manager, Larry Meck

# This evaporator is built to take it . . . it's made of stainless steel!

The installation above is the Buflovak Triple Effect Evaporator in the Oakland Plant of American Home Foods, Div. of American Home Products. Made by a leader in this field—the Buflovak Equipment Division of Blaw-Knox Co.—this unit takes plenty of punishment. Not only does it handle tomato paste with steam (both of which have a corrosive effect on ordinary equipment) but in peak periods it is pushed to 20% above its rated capacity. Yet this stainless steel evaporator continues to operate efficiently with a minimum of maintenance.

Stainless Steel is constantly called on to do a job where other steels fail. Because Eastern makes stainless steel exclusively, we are set up to offer technical assistance as well as the distribution and production facilities to deliver exactly the type of stainless needed for any fabricating problem.

When you have a job that calls for stainless, call for Eastern Stainless.

**Mr. A. F. Cornett,**
Technical Director, American Home Foods, Oakland, says:

*"Stainless steel proved out for us. It does a great job and helps us maintain product quality."*

EASTERN
STAINLESS STEEL
BALTIMORE 3, MARYLAND, U. S. A.
Stainless steel sheets, plates, strip, coils

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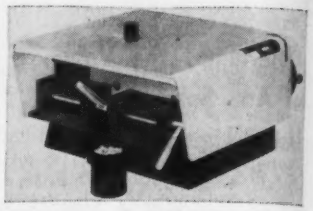
## quality control



Accuracy of field unit, shown without carrying case, is 0.1 cc with a 50 cc cup

instrument, sample is unaffected in any way. In addition, since a comparison principle is used, any change in atmospheric conditions or temperature have no affect.

Instrument weighs only 16 pounds. It may be calibrated to read in cubic centimeters or in cubic inches as specified by user.

(Model 200 Air Operated Pycnometer for determining true volume of granular, irregular or porous solids, without the use of liquids, is a development of Houston Instrument Corporation, PO Box 22234, Houston 27, Texas.)
7303 on Reader Service Slip.

### Electric mortar and pestle

**Uses:** An electric mortar and pestle is available for pulverizing, grinding, crushing, mixing samples and preparation for research analysis, optical emission and spectrographic laboratory work.

**Features:** Action of unit is reciprocating in form of a figure eight. Materials are swung through a 6½ degree arc at 3200 rpm. Results are consistently the same without checking. Ten seconds is sufficient for most samples.

**Description:** Operating time is set and automatically controlled for any predetermined time by a fine clock machine. A special model with a one hour timer and fan for longer running projects is available if desired.

(Crescent Wig-L-Bug, 5 A Model electric mortar and pestle, is manufactured by Crescent Dental Manufacturing Co., 1837 S. Pulaski Rd., Chicago 23, Ill.)
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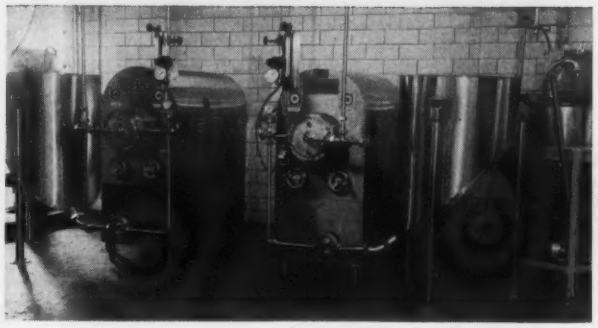


Two medium-size continuous mixers account for production of all whipped pies. One machine produces whipped toppings, the second creamy fillings. Two vertical mixers were installed to permit all ingredients. End products are pumped from continuous mixers into hoppers of depositors

# Two continuous mixers replace 10 verticals

**Versatile, continuous mixers provide:**

- **uniformity of topping, aerated filling**
- **saving in operation costs**

**PROBLEM:** Production facilities of Mrs. Smith's Pie Company, Inc., Pottstown, Pa., were unable to keep pace with sales after company had successfully entered frozen cream pie field.

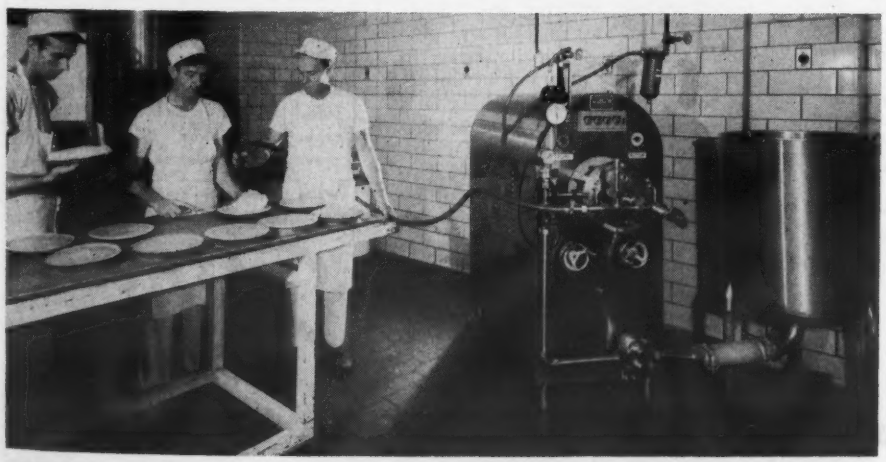
Bottleneck in production was battery of ten vertical mixers. Machines were pressed beyond capacity to keep up with demand of approximately 5300 lb of whipped cream topping and over 10,600 lb of chocolate and other whipped fillings per 8-hr shift.

**Solution:** Operation of continuous mixer in company's Philadelphia cake division showed way to answer. Now two continuous mixers, in place of ten vertical ones, produce 25 per cent more (about 2500 extra pies per shift) without additional personnel.

Ingredients, after thorough premixing in two vertical mixers, are pumped to slur tank, then to continuous mixers. From mixers, aerated whipped toppings and fillings are pumped directly into hoppers of continuous pie depositing machine.

Continuous mixers combine all ingredients and incorporate a controlled amount of necessary air into mixture. They make close control of specific gravity possible.

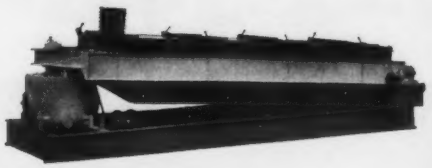
When not in use for making frozen pies,



At smaller plant of Crusty Pie Company, Inc., in contrast, application of continuous mixer is by hand. Nevertheless, use of mixer has saved $3000 during first 6 months of operation

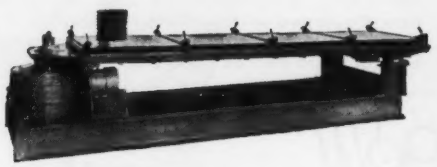
ROTEX®

SCREENERS
*and New Rotex* COOLERS



**ROTEX SCREENERS**

- Completely enclosed and dust tight.
- Quiet running, counterbalanced drive.
- Horizontal gyratory motion gives clean, accurate separations and high capacity.
- Heavy welded, steel construction.
- Low head room and fast screen changes.
- ROTEX Ball cleaners prevent screen blinding.
- Over 30 standard models with from 1 to 5 screen surfaces



***NEW* ROTEX COOLERS**

- Completely enclosed and dust tight.
- Well known, quiet running, counterbalanced ROTEX drive.
- Horizontal gyratory rotation keeps material in constant contact with entire cooling surface.
- Heavy, welded, steel construction with stainless steel interiors.
- Accessible interiors with rounded corners and smooth, polished surfaces to meet sanitary standards.
- High cooling efficiency in a low cost, sanitary, easy to clean production cooler.

*ROTEX Screeners have been widely used for nearly half a century. Now we offer the new ROTEX Cooler. Write for information on your screening or cooling application. Our experienced engineers will be pleased to cooperate with you.*

ROTEX®

**THE ORVILLE SIMPSON COMPANY**
**1246 Knowlton Street**
**Cincinnati 23, Ohio**

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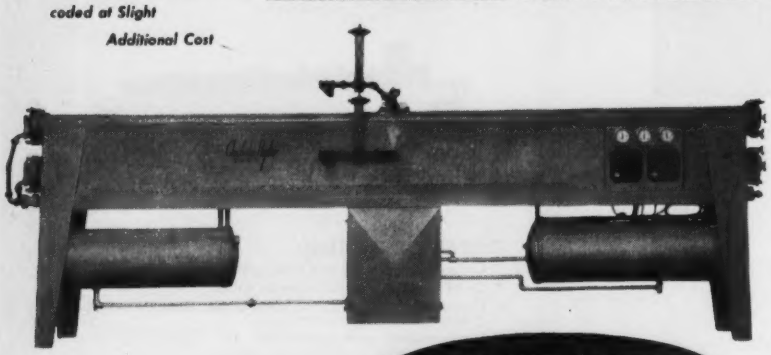
# NOW BUILT TO A.S.M.E. DESIGN

**CRCO*** *Tubular*

*"SAY "SEE-AR-CO"

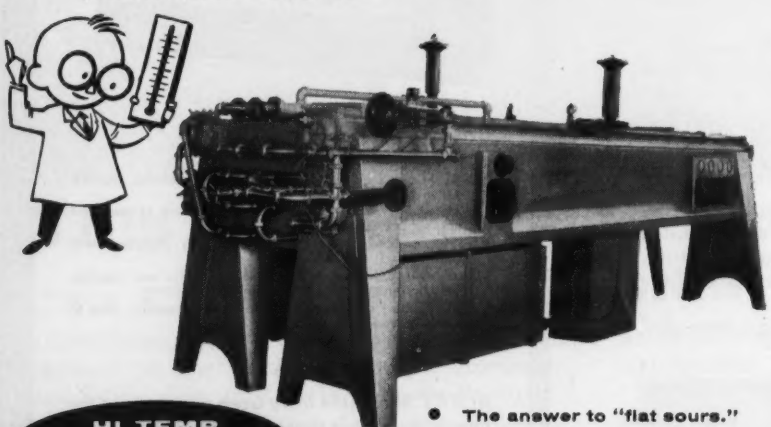
## HEAT EXCHANGERS

*Inspected and A.S.M.E. coded at Slight Additional Cost*



VACUUM STEAM MODEL

Steam is injected under vacuum for even, instantaneous and most efficient distribution. Equipped with automatic controls. Can be used to heat or cool liquids, juices, chopped products – almost any product that can be pumped.



HI-TEMP REGENERATIVE UNIT

- The answer to "flat sours."
- Processes tomato juice and eliminates "flat sours" caused by Thermoacidurans bacteria.
- Sterilizes juice up to 260° F. after extraction, then cools it for filling.
- Saves up to 30% steam by recirculating the water heated in cooling the product to preheat the chopped tomatoes. Temperatures completely and automatically controlled from instrument panel.

*For more information, Write*

THE BEST OF Everything

**CHISHOLM-RYDER CO. INC.**

*Niagara Falls, New York*

FOR THE FOOD PROCESSOR

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mixers are utilized to produce meringue, various cream fillings and practically all other items that require mixing.

**Results:** Aside from increased production, consistently uniform products from day to day, and greater stability of whipped topping — resulting in increased sales — are attained.

Continuous mixers provide better temperature control. As a result, pies can be frozen immediately after topping is deposited without requiring floor time at room temperature to allow whipped cream topping and filling to take a "set."

Mixers have cut motor horsepower requirements by 25 per cent, maintenance by two-thirds and have eliminated frequent clean-up necessitated by splattering and spill over.

("Oakes Mixer" is a product of The E. T. Oakes Corporation, Commack Road, Islip, Long Island, N.Y.)
7307 on Reader Service Slip.

### Gas immobilization for up to 600 hogs/hr

Live hogs are conveyed through a totally-enclosed chamber in which controlled atmosphere of carbon dioxide exists. Ride through gas fully anesthetizes animals so that they are perfectly quiet for shackling, sticking and bleeding.

Gas immobilization prior to killing has also led to development of prone sticking and bleeding conveyor, a new concept in slaughtering of hogs.

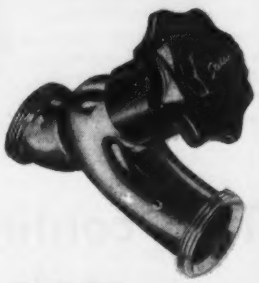
Immobilization with carbon dioxide prior to actual killing is in compliance with humane slaughtering regulations.

Four-page and eight-page reprints discuss two installations which $CO_2$ immobilization has been successfully used for some time.

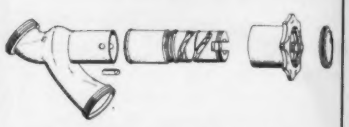
Shorter of the reprints discusses compact set-up in which hogs are fully anesthetized in approximately 30 seconds. Second reprint fully discusses slaughtering opera-


# Stehlin

## BOOT SEAL VALVES



**REVOLUTIONARY NEW DESIGN**



**NO OTHER VALVE IS LIKE THE STEHLIN BOOT SEAL!**

- ✔ Absolute simplicity — only six parts including valve body.
- ✔ Full interchangeability of actuating mechanisms.
- ✔ Complete assembly or disassembly in seconds — without tools.
- ✔ Thorough cleaning while in line.
- ✔ Full through flow with minimum pressure drop.
- ✔ Quick-acting — full open or closed with ¾ turn of knob.

Here's a valve that's seatless, sanitary, quick-opening, interchangeable, leak-proof and light weight. Operation is simple and easy . . . maintenance costs are reduced. Available in sanitary and industrial finishes and in the following types: line valves, 90° angle valves, gravity flow valves, and tank valves.

*Write for complete Technical Data File now.*

# Stehlin

## CORPORATION

1724 S. Los Angeles St.
Los Angeles 15, California

7308 on Reader Service Slip.

tion which utilizes $CO_2$ immobilization in conjunction with prone sticking and bleeding conveyor for a production rate of 600 head/hr.

(Copies of reprint on Carbon Dioxide Immobilization are available from The Allbright-Nell Co., subsidiary of Chemetron Corporation, 5323 So. Western Blvd., Chicago 9, Ill.) 7309 on Reader Service Slip.

## Safe lining materials for processing equipment

**FDA approval given to certain materials used for gaskets and linings for equipment and tanks**

FDA has given a nod of approval to the use of certain materials in making gaskets, equipment linings and protective coatings for tanks which come in contact with foods during processing or storage.

Included in this category of acceptable materials, under the Food Additives Amendment, are:

**Teflon 6** TFE-fluorocarbon resin, acceptable for gaskets and equipment lining in commercial dairy equipment.

Resin was accepted after three years of testing by E. I. du Pont de Nemours & Company, Wilmington, Del., manufacturer of the product.

In accepting data from these tests, FDA officials wrote that the "resin tested would not be subject to the Food Additives Amendment of the Food, Drug and Cosmetic Act when used in milk handling equipment."

Resin is expected to be used primarily by the milk processing industry for gaskets and lined equipment such as valves, fittings and pipes.

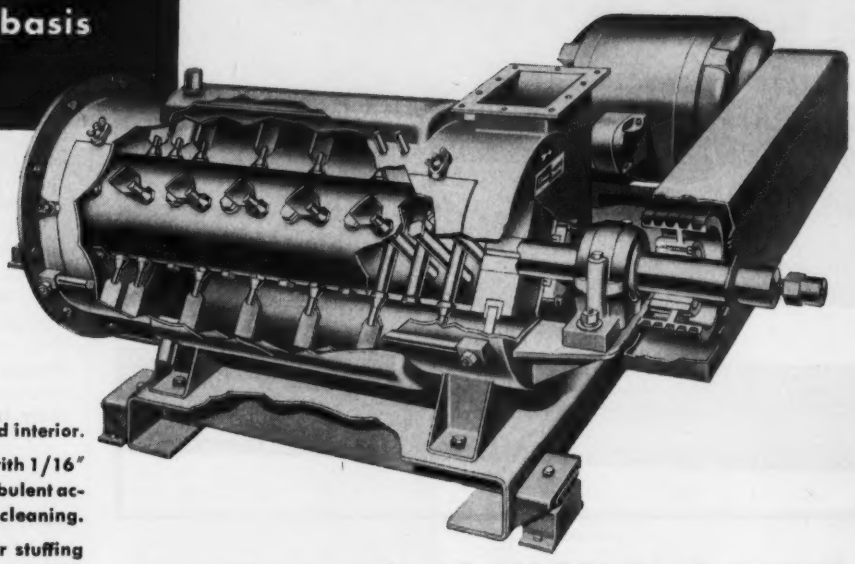
**Tropelite V-372,** a clear protective coating for interior surfaces of sugar and syrup tanks.

Coating, manufactured by Tropical Paint Co., Cleveland, Ohio, may be sprayed or brushed on. It dries rapidly to form a hard surface that pro-


There's one sure way to get intimate mixing of dry and semi-dry material on a continuous basis

Strong Scott

TURBULIZER®



EXCLUSIVE TURBULIZER FEATURES

- Heavy steel shell with machined interior.
- Paddles revolve at high speed with 1/16" clearance to shell, creating a turbulent action that makes Turbulizer self-cleaning.
- Choice of lip type, air purge or stuffing box seals. All are of split construction for quick disassembly. (Lip type seal shown.)
- Hinged door is machined as an integral part of the shell giving a perfectly smooth interior surface.
- May be equipped with jacket up to 150 PSI for heat transfer medium.
- Hollow rotor shaft for heat transfer medium gives added temperature control.
- Inlet nozzles available for adding liquids.
- Quick acting heavy lug type catches—no nuts or bolts to remove.
- Tangential inlet and discharge prevent material hang-up.
- Heavy duty outboard bearings.
- Rotating joints for easy connection to heat transfer medium source.

The Turbulizer solves many dispersion problems in the chemical and food industries. Adjustable-pitch paddles, revolving at high speed, result in the combined action of turbulence, shear and impact providing intense dispersion. These actions can be varied to obtain desired results on a specific material.

A completely smooth inner surface with 1/16" clearance paddles, assures thorough mixing, eliminates material hang-up, leaves no dead pockets of unmixed material and provides a self-cleaning operation.

In addition to the numerous features shown here, advantages of the Turbulizer include better product uniformity, increased production, plus lower labor, installation and up-keep costs.

*Write for complete details...*

Please send information on the Turbulizer

NAME_____

TITLE_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

FP-60

The Strong Scott Mfg. Co.

451 TAFT STREET NE • MINNEAPOLIS 13, MINNESOTA

EQUIPMENT DESIGNED FOR BETTER PROCESSING

7310 on Reader Service Slip.

## ALLIS-CHALMERS TAKES A LACING - TO IMPROVE PRODUCT QUALITY

**Selects CLIPPER Hooks and Lacers for durability, easy installation, and smooth operation on small rollers.**

Allis-Chalmers Manufacturing Company of Milwaukee, one of the nation's leading manufacturers of farm machinery and equipment receives multiple benefits and improvement in product quality by their application of Clipper hooks and lacers on Forage Blower and Harvester feed table aprons and draper type pick-up belts.

They find in the Forage Harvester and Blower that Clipper lacing makes possible use of protective shields against the draper. On all applications drapers are easier to install, run more smoothly on small rolls and are more durable. The material laced is two-ply rubberized material from 15½ to 35¾ inches wide and from .060 to .090 inches thick.

**For more information**— *Detailed product information and case history examples of Clipper machine-lacing benefits are contained in Bulletin No. 157. Send for your free copy today.*

*Ask your Industrial Distributor for Clipper Products*

**Clipper** BELT LACER COMPANY

972 Front Ave., N. W., Grand Rapids 2, Michigan

7311 on Reader Service Slip.


tects against acids, alkalies and moisture.

In addition to its use for granulated sugar, sugar and corn syrup drums, tanks, railway tank cars, etc., protective coating also has application in bottling plants, milk and ice cream industries and other food processing operations.

**Plasite No. 7133,** a heavy duty, chemically resistant coating, formulated particularly for the lining of tanks and equipment for the food and beverage industries.

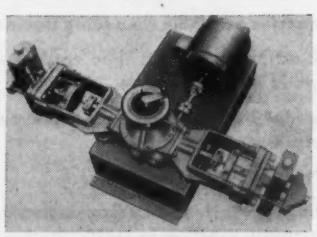
Coating will not impart taste and odor to such products as sugar solutions, wine, beer, meat products and similar food items.

With some modification, the manufacturer, Wisconsin Protective Coating Corp., Green Bay, Wis., states that coating may also be used as a one-coat, heavy film for lining storage bins, covered hopper cars and other containers handling bulk dry food materials.

### Multiple-head metering pump

Versatile pump has accuracy of ± 1 per cent, capacity from of 0.65 to 2125 gph and can operate against pressures up to 4000 psi. Product-contact parts are made of corrosion-resistant materials.

Positive displacement, reciprocating pump is designed to operate with one, two or



This duplex metering pump can be adjusted while running. It has maximum capacity of 1350 gph

three liquid ends. Multiple ends increase capacity and reduce pulsation.

Stroke length and stroke speed are the same for liquid ends. Stroke adjustment


## What's News in Milling?

**"KNOW-HOW" MAKES A BIG DIFFERENCE, TOO!**

In food milling operations two things have to be right for best results—

1. The equipment
2. The way it is used

The overall thing that ties them both together is "know-how".

What's so new about that?

Nothing, perhaps, except that Morehouse-Cowles representatives continuously run into cases where one or both are wrong. And then the news is bad — quality may suffer, volume may be cut, costs skyrocket.

Because of the "know-how" gained from broad experience with the most popular mill of its type on the market, they have been able to produce spectacular improvements in many instances. For example, production rates are being upped from 2 to 10 times the volume-per-hour on products like these —

- Almond paste
- Baby foods
- Candy fillings
- Chocolate processing, including liquors, reclaiming, coatings, syrups, etc.
- Coconut paste
- Cream fillings
- Fish paste
- Hors d'Oeuvres
- Mustard (prepared)
- Peanut butter
- Pepper sauces
- Soy bean processing
- Vegetable pastes

and hundreds of other products requiring grinding, dispersing, mixing, emulsifying, homogenizing, disintegrating

If your product involves milling, it may pay you well to look into ways and means of improvement with the help of a Morehouse-Cowles milling expert. The new Super Series Morehouse Mills plus the most "know-how" have brought about a new day in milling.

**Write us today about your problem.**

**MOREHOUSE-COWLES, INC.**
1150 San Fernando Road, Los Angeles 65, California

MOREHOUSE COWLES

Representatives in Principal Cities
Convenient Lease and Time-Payment Plans

Please send me information on use of Morehouse Mills in processing (product) .....
.....
Name ..... Title .....
Firm .....
Address .....
City ..... Zone .... State .....
609

7312 on Reader Service Slip.

changes stroke of all plungers at same time by same amount. For blending two or more liquids, a number of simplex, duplex or triplex units can be coupled to same motor.

Stroke length on one model in this series of pumps can be adjusted manually or automatically while pump is running.

Twelve-page catalog contains full description of line of pumps. Photos illustrate various units and design features, and operations are explained.

Two tables list materials of construction and capacity-pressure selection data.

("Heavy Duty Metering Pumps," Catalog 420.200, is available from Wallace & Tiernan Inc., 25 Main St., Belleville 9, N.J.)
7313 on Reader Service Slip.

### Single or multiple-surface rotary screeners

Self-contained screening machines, for separating according to particle size, are made with one, two, three, four and five screens.

Circular motion of screeners in a nearly horizontal plane conveys materials steadily down screen surface. While thus conveyed, undersize particles pass through the mesh openings.

Screen meshes are constantly cleaned and prevented from blinding by solid, resilient rubber balls. Balls are confined to pockets underneath each screen surface and are bounced against underside by motion of machine.

Line of screeners is described and illustrated in 32-page bulletin. Specifications are tabulated for various models. Construction features of the machines, as well as installation and maintenance, are discussed and pictured.

Extensive reference table for silk, nylon and wire-screen cloth is included.

("Rotex® Screeners," Bulletin 905, may be obtained by writing The Orville Simpson Company, 1230 Knowlton St., Cincinnati 23, Ohio.)
7314 on Reader Service Slip.


# GAULIN G.T.A.

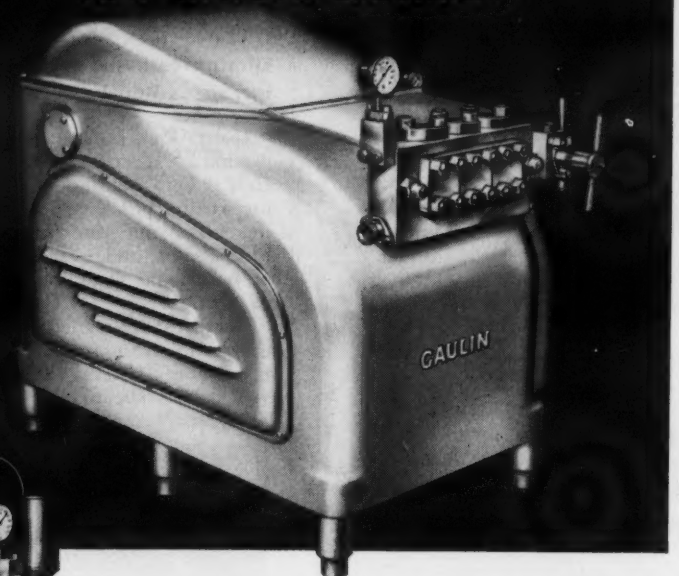
## *Gaulin Technical Assistance*

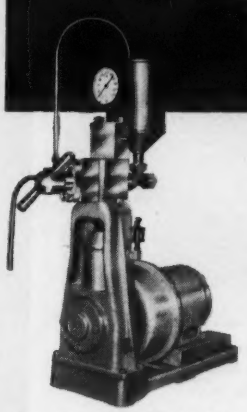
GTA Bulletins

Technical Assistance

Laboratory Analysis

**And Gaulin Homogenizers Provide the Practical Solution to Particle Control**



**Try Particle Control In Your Plant . . . Rent a Gaulin Laboratory Homogenizer for Only $75.00 Per Month!**

This versatile Machine reduces ingredients in your product to ultimate particle size . . . Minimum sample one pint; Capacity 15 GPH; Pressures up to 8000 psi. Rental costs applicable against purchase price. Write for Bulletin LH-55.

What's the best method to disperse, emulsify or blend? You can get the right answer on the most effective method with Gaulin Particle Control. Not only will Gaulin Homogenizers improve product uniformity, stop separation, accent taste, speed chemical reactions, but they will increase salability of products and cut costs.

Take advantage of Gaulin Technical Assistance, too. It provides free technical data, experienced advice and laboratory analysis. Write for GTA Bulletins . . . Homogenizers H-55, Sub-Micron Dispersers SMD-55, and Colloid Mills C-57.

Gaulin TRADE MARK
MANTON Gaulin MANUFACTURING CO., INC. EVERETT, MASS.

**59 Garden Street** **Everett 49, Mass.**

*World's largest manufacturer of stainless steel reciprocating, rotary, pressure exchange pumps, dispersers, homogenizers and colloid mills.*

## Ask GTA...

Gaulin Technical Assistance—for data on the complete Gaulin line: Homogenizers, Colloid Mills, Submicron Disperser, Triplex High Pressure Pumps and HX Pumps. Get GTA from your nearest Manton-Gaulin Representative . . .

**Akron 8, Ohio**
White Industrial Sales and Equipment Company
919 Second National Bldg.
**Birmingham 6, Alabama**
D. B. Gooch Associates, Inc.
5018 First Avenue, North
**Boston, Mass.**
Joseph H. Bertram & Company, Inc.
570 Hillside Avenue
Needham Heights 94, Mass.
**Buffalo 6, N. Y.**
A. W. Johnston Co.
2021 Clinton St.
**Calgary, Alberta**
Harvey Carruthers, Limited
122 17th Avenue, S.E.
**Charleston 1, West Va.**
White Industrial Sales and Equipment Company
1033 Quarrier Bldg.
**Chicago 6, Ill.**
Fuente and Webster Inc.
549 West Randolph St.
**Cincinnati 2, Ohio**
White Industrial Sales and Equipment Company
140 West Sixth St.
**Clearwater, Fla.**
Johnson Roney II and Associates
P. O. Box 26
**Cleveland 20, Ohio**
White Industrial Sales and Equipment Company
3639 Lee Road
**Detroit 36, Mich.**
H. A. Reed Company
19465 James Couzens Highway
**Denver 18, Colorado**
Alldredge & McCabe
847 East 17th Ave.
**Houston 2, Texas**
Edward Soph Company
768A M & M Bldg.
**Indianapolis, Indiana**
Avels Sales & Engineering Co.
1407 E. Riverside Dr.
**Los Angeles 39, Calif.**
E. M. Underwood and Company
2901 Rowena Avenue
**Minneapolis 3, Minn.**
George R. Mellema Co.
620 Plymouth Bldg.
**Montreal 9, P. Q.**
Richardson Agencies Ltd.
620 Laurentian Blvd., Suite 4
Postal Address: P.O. Box 2, Station O,
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**Newark, New Jersey**
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**Toronto, Ontario**
Richardson Agencies Ltd.
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**Tulsa, Oklahoma**
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202 East 18th St.
**Vancouver 9, B. C.**
Harvey Carruthers, Limited
1639 West 5th St.
**West Hartford 7, Conn.**
Joseph H. Bertram & Company, Inc.
998 Farmington Avenue

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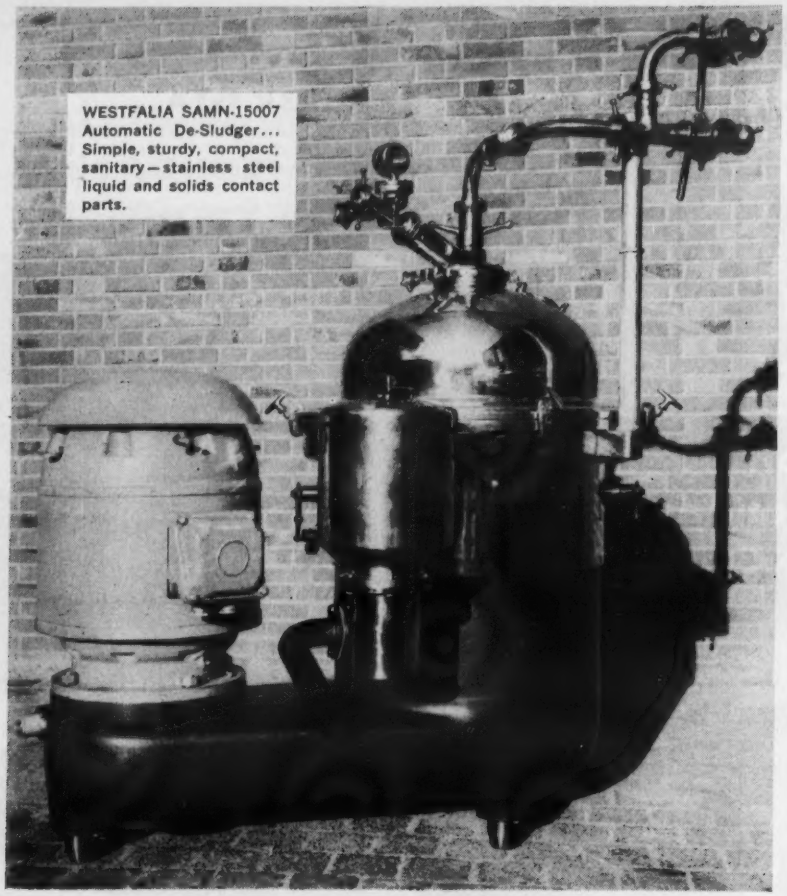


WESTFALIA SAMN-15007 Automatic De-Sludger... Simple, sturdy, compact, sanitary—stainless steel liquid and solids contact parts.


# "BIG SAM"

## for Continuous High Capacity Clarification

*...with Automatic Sludge Ejection*

"Big Sam" is catching on everywhere... citrus, grape juice, sugar, coffee and tea, you name it...producing continuously ...around the clock...fully automatic

With "Big Sam" you get:
**Highest Capacity**—up to 8000 gph, depending on product...
**Flexible De-Sludging**—full or partial, with variable solids control...
**Simplest Design**—controls easy to reach...easiest to assemble and disassemble, no clutch or gears...
**Sanitary Construction**—polished stainless steel surfaces contact liquids and solids...no "entrapment"... "CIP" cleaning possible.

**For medium capacities** ask for model SAMN-5006.

Write for Bulletin on "BIG SAM"...See our complete line of continuous centrifuges in CHEMICAL ENGINEERING CATALOG

WESTFALIA SEPARATOR | CENTRICO INCORPORATED

75 WEST FOREST AVENUE, ENGLEWOOD, N. J. • Phone LOWELL 9-0755
WESTERN DIV.: 3315 CAXTON COURT, SAN MATEO, CALIF. • FIRESIDE 5-7065

7316 on Reader Service Slip.


### Cools pellets simply, effectively

Four-page bulletin presents technical discussion of vertical coolers for drying and cooling pellets.

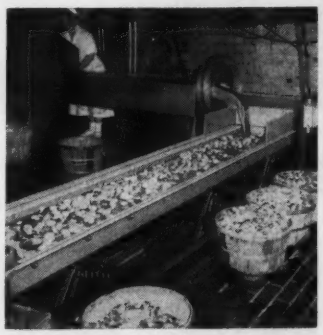
Two types of coolers, rectangular louvered and rotary vertical, are taken up in detail. Cross-sectional sketches show operation of units and movement of pellets through them.

("Vertical Coolers," Bulletin F-70, may be obtained by writing Sprout, Waldron & Co., Inc., 130 Logan St., Muncy, Pennsylvania.)
7317 on Reader Service Slip.

### Eliminates hand sorting, increases hourly output

**Uses:** For separating food products according to size. Unit is being successfully used for sorting out slices of varying sizes and for removing scraps and undersized pieces of fruits and vegetables, such as pickle ends.

**Features:** Designed to operate in combination with transverse slicers, separator will handle slicer's full capacity. It conveys products being processed at speeds of 30 to 40 fpm.



Deck of separating conveyor is 10 ft 10 in. long and 21 or 36 in. wide

**Operation:** Cut product falls directly from slicer unto screen deck, see photo above. Vibrations, induced by an eccentric drive, work larger slices to top while undersize or broken slices fall through to trough underneath.

WAXCLEEN
HI ABSORB WIPING PADS
The Best Cleaners
FOR WRAPPING MACHINES AND OTHER EQUIPMENT
WAXCLEEN quickly removes wax, grease and oil from sealing plates, rollers and belts. It prevents slowdowns, costly rewrapping and throwaways. WAXCLEEN dries fast, leaves no odor. It does not contain toxic carbon tetrachloride. Order in 1 gallon tins, 5 gallon tins, cartons of 6 one gallon tins and economical 55 gallon drums.
"HI ABSORB" Pads work well with WAXCLEEN for spot wiping. They are non woven, lint free and highly absorbent. Fine as low cost hand towels. Order in lots of 500, 1,000 and 5,000.
ALSO GMC MACHINES & SERVICE
SLABBERS
SEALING PLATES
CHOPPERS
CUBERS
SLICERS
STORAGE RACKS
WASHERS
MACHINE DESIGN
Manufactured By
GMC GENERAL MACHINERY CORPORATION
SHEBOYGAN, WISCONSIN

7318 on Reader Service Slip.

Slices of proper size discharge direct to production line; broken or undersize pieces are discharged to refuse container.

**Description:** Trough and scalping screen are made of SS. Unit's counter-balanced frame tends to neutralize and minimize vibration transmission to floor of building.

(Food Slice Separating Machine is a product of Stephens-Adamson Mfg. Co., Aurora, Ill.)
7319 on Reader Service Slip.

### Cooks, bakes or dries many food products

Eight-page bulletin describes and illustrates wide variety of infrared heat uses in food processing.

Among applications discussed are cooking yams, meatballs, pieces of chickens, veal and fish sticks, baking pies, bread and cakes, and removing moisture from, and drying icing on cookies.

Different infrared heat sources and cost analysis are presented.

("Facts about Modern Infrared," Bulletin 58-121, is available from Fostoria Corporation, Dept. 48, Fostoria, Ohio.)
7320 on Reader Service Slip.

### Continuous drying, heating or cooling

Vibrating coolers or dryers are made for direct or indirect heat exchange.

Drive may be mechanical, in which case units are equipped with variable-amplitude, mechanical-vibrating drive and vari-speed control. Drive can also be electrical by means of an electronic control which offers fine adjustment and refinements of operation.

Line of equipment is presented, with illustrations, in 32-page catalog. Also included is such auxiliary equipment as feeders, conveyors, magnetic separators, packers and controls.

Rental system for a pilot unit, which enables firms to simulate actual production conditions in their own plant, is outlined.

("Vibrating Dryers, Coolers," Catalog 953, may be obtained by writing The Jeffrey Mfg. Co., Columbus 16, Ohio.)
7321 on Reader Service Slip.

### Compact, packaged water-tube boiler

Eight-page bulletin discusses economy series of packaged boilers. Steam generators are designed for applications where on-off operation is sufficient and full modulation control is not necessary.

Boilers can be gas or oil fired and range from 40 to 150 hp in size. Built-in controls facilitate operating boiler according to hot water and steam demand.

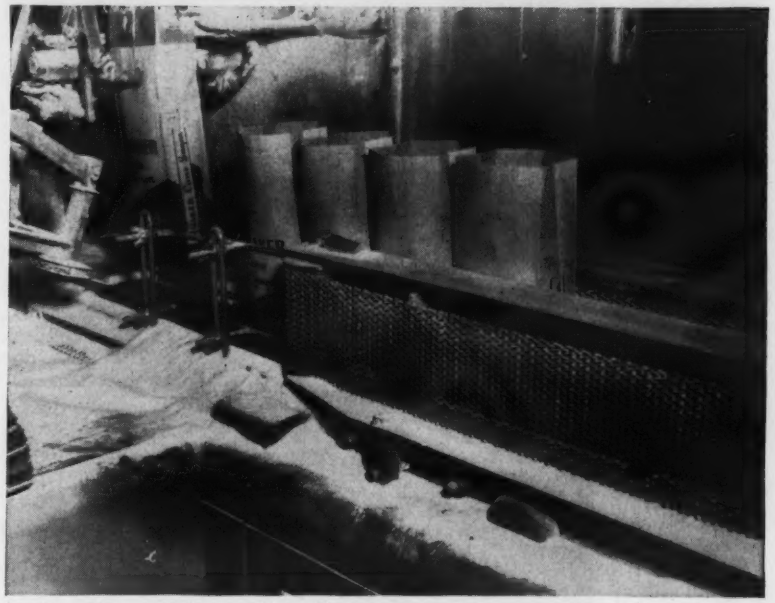
Features of boiler are present with illustrations and specifications listing performance data and dimensions are tabulated.

("Vapor Modulatic Water-Tube Boilers," Bulletin 4010, may be obtained from Vapor Heating Corporation, 80 E. Jackson Blvd., Chicago 4, Ill.)
7322 on Reader Service Slip.

### VOTE FOR YOUR FAVORITE CARTOON

See this month's "FP Hall of Fame Cartoon" on page 148, and then vote for large reproduction of your favorite on the Reader Service Slip.


## Continuous Processing Depends on Continuous Product Flow and...

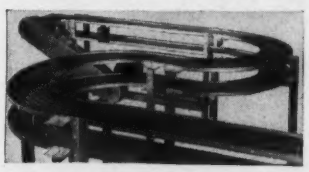


The Ashworth Balanced Weave B 36-32-16 shown above is used in sugar refining. These belts operate in the vertical rather than the horizontal plane, cushioning the containers to minimize breakage.

## ASHWORTH KEEPS YOUR PRODUCT ON THE MOVE... CONTINUOUSLY!

No matter what *food* . . . meat, poultry, candy, fruit or produce . . . no matter what *process* . . . canning, freezing, deep frying, baking or packing . . . an Ashworth Metal Process Belt can help you reduce costs by assuring uninterrupted product flow during continuous processing.

Ashworth Metal Process Belts can be fabricated from any metal or alloy capable of being drawn into wire. Within this complete family of belts—both spiral weave *and* flat wire—of carbon steel or stainless steel—you can find the mesh or weave to meet any processing requirement.



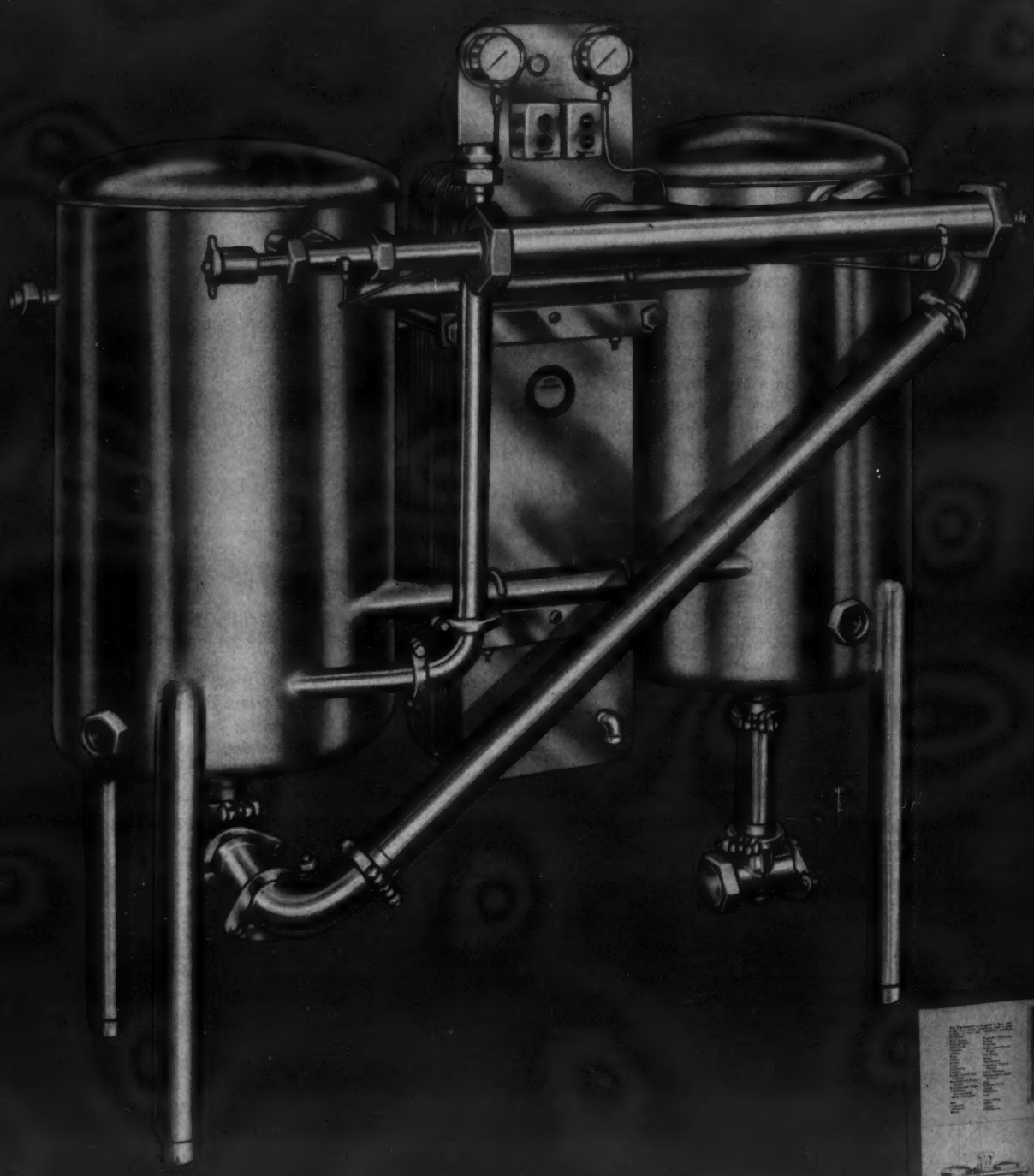
Ashworth Metal Process Belts meet every demand of sanitation, heat, corrosion, drainage or direction of flow (Patented Ashworth OMNIFLEX Belts even go around corners).

Engineering, plus accurate selection of wire analysis, plus careful fabrication insure quality woven into every Ashworth belt. You can depend on Ashworth to carry the load . . . continuously.

*Consult your nearest Ashworth Sales Engineer or write directly to:*

**ASHWORTH BROS., INC.**
**WINCHESTER, VIRGINIA**
**Sales Offices in Principal Cities**

7323 on Reader Service Slip.



ARO-VAC
HEAT AND VACUUM TREATMENT
PROTECTS NATURAL JUICE FLAVOR

# *Profitable Brands Start With Cherry-Burrell Processing Equipment*

## Stokely Van Camp uses Cherry-Burrell Aro-Vac to protect the natural juice flavor

Refreshing. Cool. Delicious. The fresh flavor of newly picked and just squeezed oranges rates Pictsweet and Stokely's Finest two of the popular first choice brands. Homemakers can rely on that refreshing flavor. They buy with confidence again and again.

Stokely Van Camp, Inc. relies on Cherry-Burrell Aro-Vac Flavorizers to keep Pictsweet and Stokley's Finest tasting uniformly fresh. To take peel oil flavor out without damaging the delicate, natural flavor of the juice.

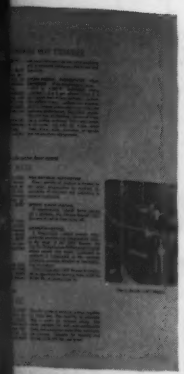
Cherry-Burrell Aro-Vacs use a steam and vacuum treatment to remove unwanted odors and taints from any liquid. The product is first quickly heated with purified, dry, unsaturated steam. The heat volatilizes unwanted materials and they are drawn off as vapor from chamber top. Then the product enters a vacuum chamber where condensed steam flashes into vapor and is pumped away with other gaseous off-flavors.

The instantaneous heating and cooling eliminates any heat damage. Doesn't change the natural flavor.

A Cherry-Burrell Sales Engineer will be glad to show you how an Aro-Vac Flavorizer will improve your product's flavor. Keep it uniformly good. And sell consistently. There's no obligation whatsoever. Call or write him today.

*Equipment for flavorizing, homogenizing, heating, cooling, storing, separating, freezing, mixing, packaging and conveying.*

CHERRY-BURRELL
CORPORATION
CEDAR RAPIDS, IOWA



FOR YOUR
FREE COPY OF CHERRY-BURRELL'S
FOOD PROCESSING
EQUIPMENT CATALOG
JUST WRITE US.
OUR CATALOG WILL BE SENT BY RETURN MAIL.

7324 on Reader Service Slip.




### Electrical stunning for humane hog slaughtering

Simple electrical stunning system consists of control box and probe, and insulated restraining pen. Single unit can handle kill rate of 600 animals per hour.

As hogs are driven into restraining pen, its sides gently "squeeze" animal and hold it immobile.

Electric probe is laid across head of hogs between eyes and current, which is applied through two points on probe, instantaneously stuns animals into anesthesia. Neoprene belt conveyor built into pen discharges stunned animals.

Adaptable to other small stock as well as hogs, stunning system complies with Federal Humane Slaughtering laws.

System is fully described in four-page brochure. General plan of operation is illustrated and there is also a three-dimensional, general plant layout for slaughtering hogs at rates from 100 to 300 per hour.

("Globe-Engelhorn Humane Electrical Stunning System," Brochure, may be obtained by writing The Globe Company, 4000 S. Princeton Ave., Chicago 9, Ill.)
7325 on Reader Service Slip.

### Steamless, low-temp milk evaporation

Evaporation of water out of milk is accomplished in double-effect evaporator. Instead of steam, heat of evaporation is supplied by ammonia gas. Heat exchange in evaporator drives off water from milk and condenses ammonia gas into liquid.

Liquid ammonia is circulated to condenser where it is evaporated back into gas. Necessary heat for evaporating ammonia is extracted from water vapors coming from milk evaporator.

As ammonia is evaporated, water vapors are condensed and removed by condensate pump.

Ammonia gas from condenser flows to compressor or heat pump and then back to

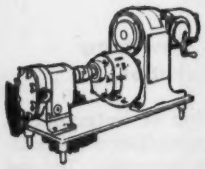
# VITAL DECISION

## selecting the pump for your product

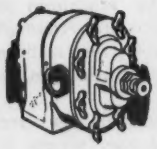
## You can be more selective with a WAUKESHA

### POSITIVE DISPLACEMENT PUMP

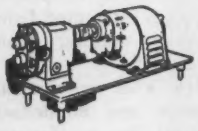
When you've been producing positive displacement pumps for nearly half a century, you learn a few things. Specifically: that no single pump can possibly perform in every stream . . . that the wisest economy you can practise is to place your initial investment in a pump engineered for your product.



With a Waukesha, you *can* be completely selective . . . with a pump engineered to give trouble-free flow, increased life span on the job and less costly down-time *in your specific product stream.* Waukesha offers more than 500 positive displacement pump combinations for capacities from 0 to 300 G.P.M., a choice of metal or rubber impellers, vertical or horizontal ports, in Stainless Steel or "Waukesha" metal (nickel alloy). Consultation with our research staff can determine which specific pump application is the 1 out of 500 for your product.



*NOW — Waukesha offers a complete line of sanitary fittings, valves and centrifugal pumps.*



WAUKESHA FOUNDRY COMPANY

**Waukesha, Wisconsin • Write Dept. 58**

7326 on Reader Service Slip.


evaporator, completing cycle.

Concentrated milk from evaporator is sprayed into dryer through atomizing nozzle. Powder is blown through primary and secondary collectors and final-product collector. Last steps of process consist of sifting and bagging powder.

Push-button, one-man operation is described in ten-page bulletin. Complete process is presented in color-coded flow chart.

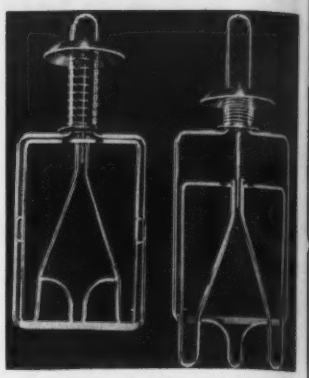
Literature points out other features of process, such as utilization of waste heat from diesel or gas engine which drives compressor and CIP components in equipment.

Several case histories and complete specifications for selecting proper components for system are included.

("Lo-Temp Process," Bulletin 372-18, is available from Mojonnier Bros. Co., 4601 W. Ohio St., Chicago 44, Ill.)
7327 on Reader Service Slip.

### Automatically unshackles birds

**Uses-Features:** Sliding action of shackle assures positive, automatic ejection of birds,



Automatic shackle in load and carry position, left, and in eject position, right

whether hung by neck or legs.

Shackle is designed for quick handling and freedom from tangling on line. It is simple to load and has been approved by the Department of Agriculture.

**Description:** Poultry shackle is made in two models; one is for picking and second is for eviscerating.

It is fabricated of ¼-in. diameter steel and is chromium plated.

(Poultry shackle is available from E. H. Titchener & Co., 57 Clinton St., Binghamton, New York.)
7328 on Reader Service Slip.

"S'all right — he's with me!"

### Remove flavors, off-odors after UHT processing

After pasteurization at ultra high temperatures, milk is treated to remove most of volatile off-odors and flavors.

Treatment essentially consists of flashing product, either alone or with steam vapors, into vacuum chamber.

Flashing vaporizes out of product some moisture and with it flavors and off-odors. Flashing with steam removes nearly all common volatile off-flavors and odors. It also eliminates product shrinkage associated with simple flashing.

Discussion of complete process and equipment necessary is presented in eight-page bulletin. There is a two-page layout showing processing steps and necessary units for HTST pasteurization, flavor removal and homogenization.

Brochure describes in detail and illustrates auxiliary equipment and how it is used.

("Vac-Heat Product Treating Processes," Bulletin E-1255, may be obtained by writing The Creamery Package Manufacturing Company, 1243 W. Washington Boulevard, Chicago 7, Illinois.
7329 on Reader Service Slip.

Increases baker's production with . . .

### Dough mixer utilizing blade of complex configuration

At Baily's Inc., Flushing, N.Y., mixer, pictured below, has doubled production. It is capable of producing 900 lb of straight dough in 90 minutes — enough for 600 dozen rolls.

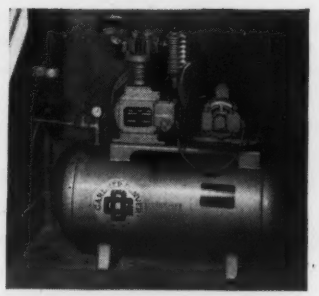
Mixer has intricately-shaped, cast stainless mixing arm, designed to impart "figure-8" mixing action. Blade is pitched to move dough from left to right and from right to left as it is turned up in front and down in back of mixing bowl.

Blade casting, made of ACI

# Air helped produce these products . . .
# pure, oil-free air from GARDNER-DENVER

This Gardner-Denver Model CRX has enabled many an industry to utilize low-cost compressed air power without penalty to their products. The CRX produces pure, oil-free air without special filters. It provides versatile "go" power to help speed production, cut costs, and keep air-actuated equipment moving.

If a trace of oil in your air line is *too much*, ask your Gardner-Denver Compressor Specialist about the CRX. Sizes range from 100 to 1400 cfm.



For a small, oil-free compressor, the Model CACB is hard to beat. Supplies 4 to 5 cfm . . . discharge pressures 40 to 100 psi.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Ave., Toronto 16, Ontario

7330 on Reader Service Slip.

# WHAT 7 THINGS HAPPENED RECENTLY AT FRICK COMPANY* IN WAYNESBORO, PENNA. ?

*7 important things for* FRICK *and you:*

*1.* First of all, on a foundation of our 107 years' experience, our new management has established a growth policy that stresses new product development, quality control, and expansion of field services.

*2.* New branch offices are being opened and the sales-engineering staffs of existing branches as well as of the home office are being increased.

*3.* A compressor of new design is being developed. This, like our current dependable line, will handle a variety of refrigerants such as Freon, ammonia, propane, butane and carbon dioxide.

*4.* A new circulating system using refrigerated sea water has been introduced to commercial fishing fleets, at a saving to boat owners.

*5.* Completely insulated Shell-Ice makers have been "packaged" for convenient field installation.

*6.* Service to the growing poultry industry has been highlighted by our new counter-flow-continuous poultry chiller, which uses refrigerated water instead of ice.

*7.* As part of the growth policy, we are increasing the number of Frick distributors. Some of our distributors have been with us 50 years.

*All of which indicates one thing:* Frick is "on the move!" If you're passing through Waynesboro this summer, stop in and see for yourself; you'll be able to enjoy our remodeled and air conditioned offices.

FRICK COMPANY
Waynesboro, Penna.

*Pioneers in depend*ability* since 1853: air conditioning, refrigerating, ice making and quick freezing equipment, power farming machinery and portable sawmills.

7331 on Reader Service Slip.

type CF-16 F alloy (19% Cr, 10% Ni), has smooth and homogeneous surface, therefore presents no crevices to harbor bacterial growth.

Casting is made in one streamlined integral 160 to 400-lb piece, depending upon size of mixer. It is immune to corrosive attack from organic acids, enzyme action of yeast and attack by cleaning chemicals or mechanical brushing and scouring.

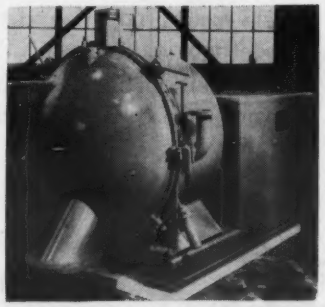
Mixer is furnished in small and large sizes, geared for 27 rpm or 20 to 40 rpm.

(Mixers with cast stainless blades are products of Peerless Bread Machinery Corporation, Sidney, Ohio.)
7332 on Reader Service Slip.

### High capacity universal centrifuge

**Uses:** For removing solids from liquid carrier.

**Features:** Centrifuge has capacity up to 30 tons per hour when processing free-draining materials. It is designed for internal pressure



First of new line of centrifuges is this 40-in. model


# Highly Intimate Blends in 1 to 2 Minutes

### Blends while discharging; No segregation or flotation

Sturtevant Rotary Blenders start 4-way blending while charging, continue it during discharge, thus producing highly intimate, even blends of dry and semi-dry materials – within 3 to 5 minutes of start of charging.

Six *complete* blending cycles per hour are common. And Sturtevant's special action produces no particle reduction, cleavage or attritional heat – is highly effective yet gentle and safe even with explosives.

**Receiving**
Scoops cascade material as drum rotates. Movement forces material from both ends to middle. Thus blending is 4-way right from start of charging.

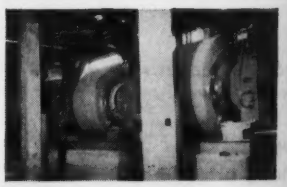
**Discharging**
Single gate controls charge, discharge. Blending continues throughout discharge phase. Result is no segregation or flotation — highly intimate, even blends.

### Self-cleaning, dust-sealed drum; one-man accessibility

Operation of Sturtevant Blenders is self-cleaning – drum interiors are completely dust-sealed. For inspection of all models, one man simply loosens a few lugs to remove manhole cover – quickly and easily.

### Nine standard models with capacities to 900 cu. ft.

10 cu. ft. Sturtevant Blender at U.S. Steel Corp.'s new Applied Research Laboratory (Raw Materials Division) in Monroeville, Pa. This unit handles batches up to 500 lbs. — is ideal for pilot work and small runs.



Automatically controlled, three 50 cu. ft. Sturtevants blend chocolate powder and other ingredients for Hershey Chocolate Corp. Operating in a group, each Blender can process more than a ton per batch. Quick accessibility and self-cleaning features keep maintenance to one hour per week.

### Fully or semi-automatic, or manually controlled operation

Constructed of carbon steel, stainless steel or Monel metal, Sturtevant Rotary Blenders are engineered to fit each customer's needs – can be supplied with injector sprays and any desired control system.

For more on Sturtevant Blenders, request Bulletin No. 080B. (Bulletins also available on Mixers, Air Separators, Micronizers, Crushers and Grinders.) Write today. STURTEVANT MILL CO., 122 Clayton St., Boston, Mass.

7333 on Reader Service Slip.

operation up to 150 psi at speeds of 1000 Gs.

Provision is made on discharge knife and chute that enables peeler knife to enter cake at successively increasing depths with each discharge cycle.

**Description:** Clamping and self-aligning seal on front door enables it to be closed in seconds. Sealing arrangement of housing is also self-aligning and self-sealing for complete pressurizing.

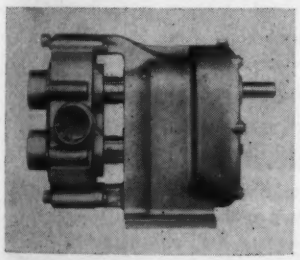
Centrifuge is powered by 75 hp motor for maximum drum speed of 1300 rpm. Capacity of drum is 8 cu ft.

(HS 40 W Universal Centrifuge is a product of Chemical Machinery Division of Baker Perkins Inc., 1000 Hess, Saginaw, Michigan.)
7334 on Reader Service Slip.

### Pumps 100 gpm at 200 psi

**Uses:** For practically all liquid food products of high or low viscosity except dairy products.

**Features:** Positive displacement pump was designed for heavy duty, slow speed (max rpm — 500) and long life. It



Pump head can be quickly disassembled for cleaning

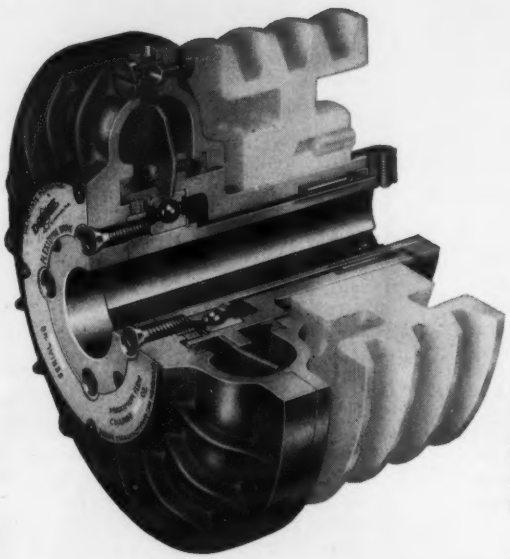
creates minimum amount of pulsation, aeration and agitation.

**Description:** All product-contact surfaces of pump are made of 316 stainless. It has twin, balanced impellers, single or dual mechanical seals and helical timing gears.

(Positive displacement pump is a product of the Waukesha Foundry Co., Pump Div., Dept. 76, Waukesha, Wis.
7335 on Reader Service Slip.


WHAT'S YOUR PROBLEM?...

- ☑ Overheated motors?
- ☑ Excessive belt maintenance?
- ☑ Breakage of materials being processed —like thread, wire, paper?
- ☑ Expense of oversize or high torque motors?
- ☑ High demand rate?
- ☑ Expense of reduced voltage starters?
- ☑ Clutch trouble?
- ☑ Breakage of transmission parts due to instantaneous shock loads?
- ☑ Damage and recurring down-time from overloads?



FLEXIDYNE

THE DRY FLUID DRIVE

It is no longer necessary to accept the destructiveness—the costliness—of conventional starting in the mechanical transmission of power. Flexidyne changes that!

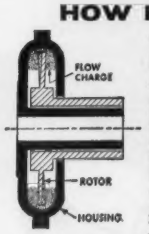
Flexidyne is the new way to start loads *smoothly*—to protect against shock and overload—to save power—all *without any sacrifice of efficiency at full load!*

This revolutionary development is ushering in "the day of the soft start"—which can mean thousands of dollars to you in equipment savings and in better, more economical operation.

Flexidyne is available, off the shelf, in Drives and Couplings. Capacities range from fractional to 1,000 hp. Ask your local Dodge Distributor or write us for technical bulletin.

DODGE MANUFACTURING CORPORATION, 2400 Union St., Mishawaka, Ind.

HOW FLEXIDYNE WORKS




The "dry fluid" in Flexidyne is tiny heat-treated steel shot. A measured amount, called the "flow charge," is contained in the housing, which is keyed to the motor shaft. Inside the housing is a rotor, free to revolve relative to the housing, but connected to the load.

When the motor is started, centrifugal force throws the flow charge to the perimeter of the housing, packing it between the housing and the rotor, which transmits power to the load. Initial slippage is momentary. Housing and rotor become locked together and achieve full load speed without slip and at 100% efficiency.

**CALL THE TRANSMISSIONEER** — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."

DODGE

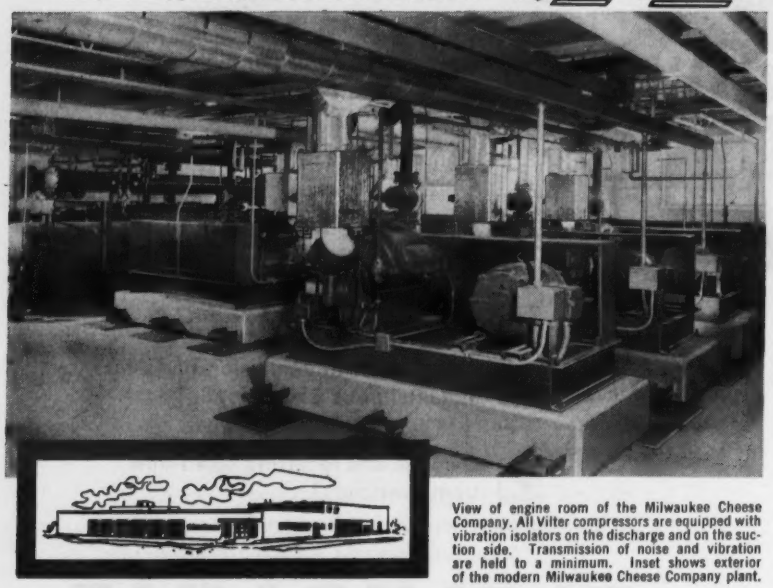
of Mishawaka, Ind.

7336 on Reader Service Slip.

# 300 kinds of tempting cheese held to taste perfection under precise temperature and humidity control

Milwaukee Cheese Company is the home of world famous Beer Kaese, Kimelkase, Queen of Wisconsin, and Wunderbar among others.

Beer Kaese



View of engine room of the Milwaukee Cheese Company. All Vilter compressors are equipped with vibration isolators on the discharge and on the suction side. Transmission of noise and vibration are held to a minimum. Inset shows exterior of the modern Milwaukee Cheese Company plant.

Keeping customers happy with a wide variety of tasty cheeses and specialty food products is the engaging business of the Milwaukee Cheese Company. Helping to preserve the "goodness" of their products is a Vilter refrigeration system.

The refrigeration installation consists of a two-stage system employing Vilter VMC reciprocating compressors for both stages. The set-up incorporates liquid recirculation using Refrigerant-12.

In the freezer room, the air units are fed by two recirculating pumps. The refrigerant is circulated to two large air units whose air is distributed through efficient duct work. The air units are defrosted automatically by hot gas.

In addition to the warehouse proper, Vilter supplied a self-contained condensing unit and an air unit for the proper air conditioning of the packing and slicing room. This job called for holding precise temperatures and humidities, and in every instance these temperatures and humidities have been maintained.

Why not enjoy trouble-free Vilter equipment in your installation. Write Vilter, today, for helpful counsel about your air conditioning and refrigeration problems.

Vilter® refrigeration air conditioning

**The Vilter Manufacturing Company**
**Milwaukee 7, Wisconsin**

Air Units • Ammonia and Freon Compressors • Booster Compressors Baudelot Coolers • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake Ice machines.

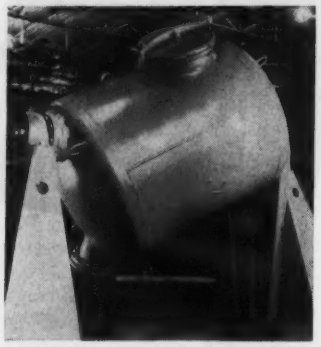
**Write for Bulletin 820 to The Vilter Manufacturing Company, Dept. D-908 2217 South First Street Milwaukee 7, Wisconsin**

7337 on Reader Service Slip.


*processing*

### Sanitary blender for dry products

**Features:** Unjacketed blender has glassed interior which makes it non-contaminating and highly resistant to corrosion. Also, products will not



Product is not exposed to metal during any phase of blending since interior is completely glass lined

adhere or built up on interior surface.

Smooth, fired-glass finish makes for easy cleaning; surfaces need only be flushed with water.

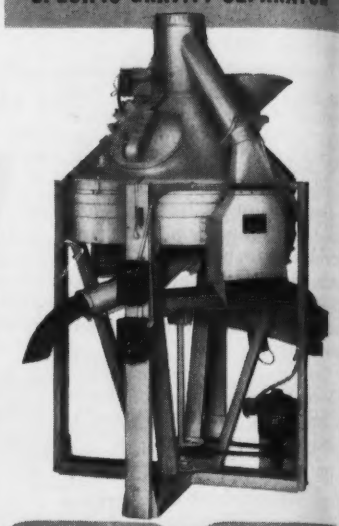
**Description:** Blender is made in 4, 30, 60, 100 and 250 cu ft working capacities. Power is transmitted through variable-speed drive.

For fast loading or inspection, machine has quick-opening port whose surfaces are also glassed. Discharge is located at lowest point for complete emptying.

(Glasteel blender is manufactured by The Pfaudler Co., division of Pfaudler Permutit Inc., 1100 West Ave., Rochester, New York.)
7338 on Reader Service Slip.

See this month's "FP Hall of Fame Cartoon" on page 148, and then vote for large reproduction of your favorite on the Reader Service Slip.


**Bauer**
**SPECIFIC GRAVITY SEPARATOR**



**upgrades** your food product

Through a unique combination of mechanical and pneumatic action, this Bauer "jitterbug" has established a new standard for cleaning and/or separating various materials by densities.

**typical uses:**

Cleaning peanuts, fancy nuts, grains, cereals, beans, dry onion skins, etc. Separating corn germ and grit, bean hull and meat, cocoa nibs and shells, etc. Assures a cleaner end product with more sales appeal.

**what it does:**

Removes foreign material, chaff, twigs, shell fragments, string, mud nuts in the shell, even dust and skins. Also stones, mud balls, glass, wire and other tramp metal thus protecting processing equipment from damage.

Send for complete information.

**THE BAUER BROS. CO.**
Springfield, Ohio

7339 on Reader Service Slip.

# Uniformly pulverizes frozen foods

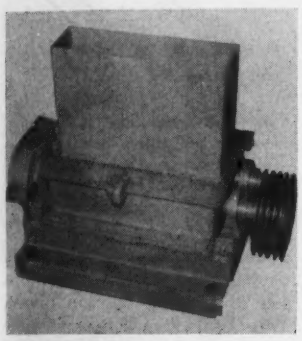
**Cuts up to 10,000 lb/hr without prior thawing**

**Uses:** For shredding blocks of frozen foods, such as milk, cream and fruit.

**Features:** Positive milling and shearing action of pulverizer rapidly cuts frozen food blocks to uniform fineness.

Twin-rotor shredder speeds up processing by eliminating thawing prior to size reduction; speeds up thawing, when required, after cutting.

Machine is self feeding. It will shred blocks as rapidly as they are placed into feed hopper.



Frozen food blocks when placed in chute feed by gravity against rotating cutters, are pulled further downward by knife engagement

Design of pulverizer is such that cutting action occurs without chattering or bouncing of block.

**Description:** Machine has two rotors or heads which revolve toward each other from top downward.

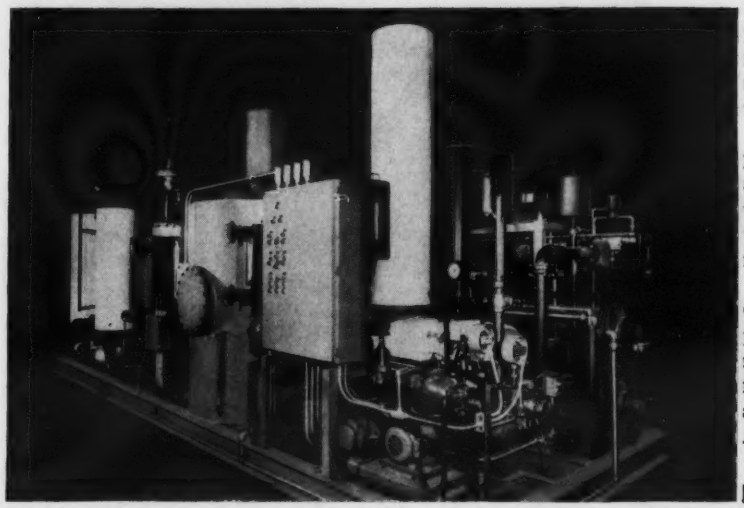
Two cutters, 180° apart, are mounted on each rotor. Each pair of cutters consists of one serrated knife and a straight-edged knife. Latter is set at smaller distance from periphery than serrated knife.

Machined into rotor immediately in front of knives are grooves or relief cavities to receive cuttings or chips.

Pulverizer is made in three


gas Atmospheres, inc

THE NATION'S LARGEST MANUFACTURER OF PACKAGED GAS GENERATOR SYSTEMS



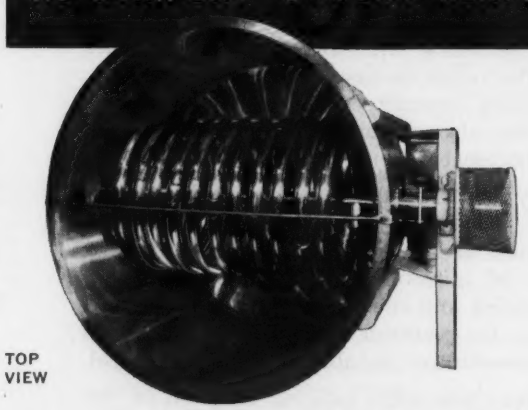
**Performance Plus** floor-saving compactness, trouble-free maintenance and "minute man" service. That's what you get when you specify Gas Atmospheres Packaged Gas Generation Systems.

You get full capacity and the dryness and purity you specified in quality-built packaged units that are set on a common base and completely factory tested prior to shipment. And, you can rely on the best factory trained service team in the business whenever your operation calls for it.

It's this kind of customer service that has made Gas Atmospheres Packaged Generators the most popular units working today. Gas Atmospheres makes a complete line of Packaged Generators for inert, $CO_2$, nitrogen, hydrogen, reducing and annealing gases. Literature available. Write *Gas Atmospheres, Inc., 20011 Lake Road, Cleveland, O.*

7340 on Reader Service Slip.

NO BURN-ON! UNIFORM HEAT!



TOP VIEW

ROTARY COIL HOT-BREAK AND COOKING UNIT

Continuous rotary action of 36″ diameter coil wipes off product—prevents burn-on. Handles 24 tons of tomatoes an hour, raising to 200° F. temperature. Rotating 3″ diameter copper tubing or stainless steel coil in 1,296 gallon stainless steel tank is faster, gives more uniform heat, saves fuel and steam. Write for complete details, specifications and prices.

F. H. LANGSENKAMP CO.
227 E. SOUTH ST. • INDIANAPOLIS 4, INDIANA

7341 on Reader Service Slip.

*match food products accurately with*

**COLOR STANDARDS**

- Permanent . . . non-fading colors of 4¼" PORCELAIN ENAMELED STEEL squares
- Custom made to match your product
- Impervious to acids, moisture, etc.
- For visual or colorimeter comparison

*ALSO AVAILABLE • REFLECTANCE STANDARDS*

Write for price schedule

THE ERIE CERAMIC ARTS COMPANY
Standards Dept.
ERIE, PENNSYLVANIA

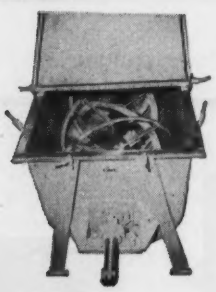
7342 on Reader Service Slip.

NEW...

STRONG-SCOTT
INDUSTRIAL
RIBBON
BLENDER

Specially designed to give top mixing efficiency and meet sanitary codes

Rounded tub ends prevent material hang-up, neoprene cover-seals provide dust-tight fitting.



Discharge modifications made to suit installation.

- Swing or slide-type discharge gate, curved to eliminate dead pocket.
- Unique coupling permits vertical removal of agitator assembly without disturbing shaft ends and bearings.
- Heavy-duty, outboard anti-friction bearings.
- Air-purge, lip seal or stuffing box seals readily removed for quick cleaning.
- Dust-tight covers, with quick-action clamps.

Top mixing efficiency with the new Strong-Scott Ribbon Blender mixer on dry or semi-dry materials, has been proven through continuous testing. The Ribbon Blender also meets requirements of health codes where necessary.

The ability to thoroughly and quickly mix is provided by a unique "ribbon assembly." The smallest amount of additives are thoroughly mixed in a matter of minutes. Special smooth-surface, cornerless welding and rounded corners throughout, leave no place for material to gather. The cover is seal-tight for maximum cleanliness and dust control.

Nine different size units ranging from 16 to 300 cubic feet working capacity are available in stainless steel or carbon steel. Jackets for heat transfer mediums also available.

EQUIPMENT DESIGNED FOR BETTER PROCESSING

The Strong Scott Mfg. Co.

Dept. FP, 451 Taft Street N. E., Minneapolis 13, Minnesota

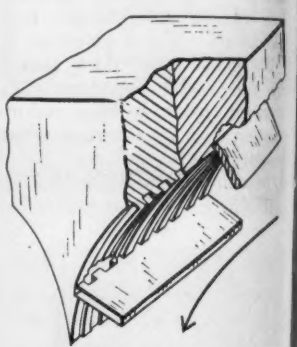
7343 on Reader Service Slip.



sizes: 6 by 20 in., 10 by 20 in. and 13 by 20 in. Recommended motor size for 6 by 20 in. model is 25 hp at 1800 rpm. When powered by 30-hp motor, it will cut 10,000 lb/hr.

**Operation:** Gravity feed is supplemented by cutting action of reversely inclined knives. Cutting action occurs only when knives move inward and downward against surface of material being cut.

Serrated knife removes from grooves an amount of material



Serrated knife cuts to form alternate projections and notches. Straight-edged knife that follows takes shallower cut and removes only portion of projections

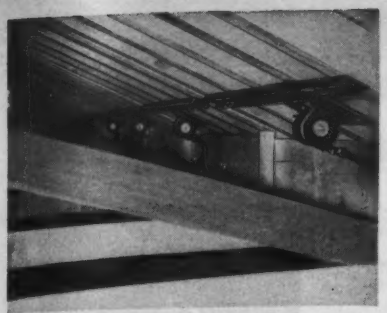
equal to that removed from projections by straight knife, see photo and caption above. Thus both knives remove same amounts of material.

Relief grooves in front of knives collect cut material and discharge it into receiving pan. As a result, cuttings cannot pile up ahead of leading edges of knives, therefore cannot accumulate between knives and surface of block being cut.

Thus block is maintained from chattering or bouncing away from and toward rotors.

(Twin-head Pulverizing Machine is manufactured by Bloomquist Machine Mfg. Co., Sixth St. North at Marshall Hill, Wausau, Wis.)
7344 on Reader Service Slip.

**Special opportunities for you in the Classified Advertising section, page 150**



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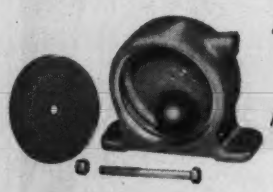

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## technical literature Classified Listing

- **Equipment**
- **Ingredients**
- **Supplies**

Starred* items below have been more extensively reviewed elsewhere in the magazine. Items followed by (†) indicate literature offered by advertisers. Key numbers in the last line will help locate these reviews, which are numbered in sequence.

### Processing Equipment, Accessories

**40 to 150 hp water-tube, packaged boilers***, 8 pp, (Bul 4010) Vapor Heating Corporation
7322 on Reader Service Slip.

**Electrical stunning of small stock for humane slaughtering***, 4 pp, (Brochure) The Globe Company
7325 on Reader Service Slip.

**Humane hog slaughtering with $CO_2$***, two reprints, The Allbright-Nell Co.
7309 on Reader Service Slip.

**Reviews two types of pellet coolers***, 4 pp, (Bul F-70) Sprout, Waldron & Co., Inc.
7317 on Reader Service Slip.

**Off-odor removal and UHT pasteurization***, 8 pp, (Bul E-1255) The Creamery Package Mfg. Co.
7329 on Reader Service Slip.

**Uses no steam in evaporating milk***, 10 pp, (Bul 372-18) Mojonnier Bros. Co.
7327 on Reader Service Slip.

**Many applications of infrared ovens***, 8 pp, (Bul 58-121) Fostoria Corporation
7320 on Reader Service Slip.

**Vibrating heaters, coolers and dryers***, 32 pp, (Cat 953) The Jeffrey Mfg. Co.
7321 on Reader Service Slip.

**Self-cleaning, multiple-surface screeners***, 32 pp, (Bul 905) The Orville Simpson Company
7314 on Reader Service Slip.

**Versatile metering pump has compound for metering and blending***, 12 pp, (Cat 420,200) Wallace & Tiernan, Inc.
7313 on Reader Service Slip.

**Sodium and calcium caseinates—High-quality protein supplements†**, (Technical Data) Sheffield Chemicals
7346 on Reader Service Slip.

**Wholesale price list of essential oils, citrus concentrates, aromatic chemicals, etc.***, 12 pp (Brochure dated March, 1960) Fritzsche Bros.
7347 on Reader Service Slip.

**Freezer room compressors offer precise temperature and humidity control†**, (Bul 820) Vilter Mfg.
7348 on Reader Service Slip.

**Highly intimate blends in one or two minutes†**, (Bul 080B) Sturtevant Mill
7349 on Reader Service Slip.

**In-line processing and laboratory homogenizers†**, (Bul LH-55) Manton Gaulin
7350 on Reader Service Slip.

**Complete line of screening material in alloys, mesh and wire combinations†**, (Cat. 57) Multi-Metal Wire Cloth Co.
7351 on Reader Service Slip.

**Using edible whey***, 4-page brochure, Western Condensing
7176 on Reader Service Slip.

**New supplier of citric acid***, 4 pp, (Bul 601C) Bzura Chemical
7184 on Reader Service Slip.

**Odor, flavor and sensory panel studies as an aid to improving your product***, (Accordion fold-out brochure) Foster D. Snell
7175 on Reader Service Slip.

**Homogenizing with ultrasonics,** 6 pp, (Bul 259) Sonic Engineering Corp.
7352 on Reader Service Slip.

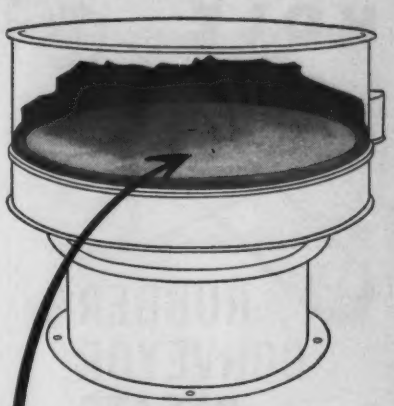
**Reports on progress in food automation and material handling,** 20 pp, (Mag.) Mojonnier Bros. Co.
7353 on Reader Service Slip.

### Management, Administration

**How you can improve supervisory performance***, 12 pp, (Brochure on "Guidance That Pays") Elliott Service Co.
7164 on Reader Service Slip.

### Packaging, Labeling, Cartoning

**Applications and application devices for cord-like hot melt adhesive system***, 16 pp, United Shoe Machinery
7242 on Reader Service Slip.

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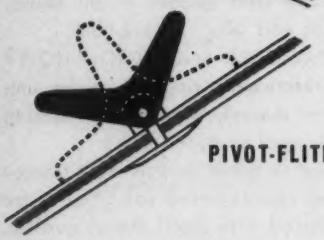


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## *new literature*

### Bulk Handling, Accessories

**Standard units, systems for aerated bulk transport***, 20 pp, Systems Engineering and Mfg. Co.
7252 on Reader Service Slip.

**Use and care of stainless steel shipping drums†,** (Booklet), Inland Steel Container Company
7356 on Reader Service Slip.

**Case history on pneumatic system for handling bulk flour†,** (Bul 1-54) Sprout-Waldron
7357 on Reader Service Slip.

**Stainless steel storage tanks, transport tanks, holding and surge tanks†,** (Literature) Walker Stainless Equipment Co.
7358 on Reader Service Slip.

**Compact pneumatic conveying system for railcar, truck or bin unloading,** 2 pp, (Bul 214) Sprout-Waldron
7359 on Reader Service Slip.

**Multi-purpose dumpers for all free-flowing material, all standard and special containers,** 8 pp, (Cat 59) Essex Conveyors
7360 on Reader Service Slip.

### Conveyors, Racks, Accessories

**Handbook shows how to save up to 1/3 on next conveyor†,** (Handidrive Handbook) Standard Conveyor Co.
7361 on Reader Service Slip.

**Flat-top chain conveyor belts†,** (Cat 1050) Link-Belt
7362 on Reader Service Slip.

**Metal-mesh belts—heatproof, coldproof, or acidproof†,** 130 pp, (Reference Manual) Cambridge Wire Cloth Co.
7363 on Reader Service Slip.

### Over-the-Road Trucks

**"How to Get Out of the Trucks Business"†,** (Booklet) Hertz Truck Lease
7364 on Reader Service Slip.

### Controls, Regulators, Indicators

**Flow-control switches for tanks, bins***, 4 pp, (Bul 159) Stephens-Adamson Mfg. Co., Standard Products Division
7280 on Reader Service Slip.

**Indicates, controls temperatures remotely***, 2 pp, (Data Sheet) Minneapolis-Honeywell Regulator Co.
7293 on Reader Service Slip.


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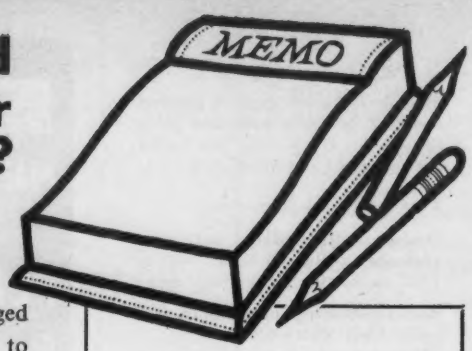


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## new literature

**Versatile, low-range pyrometer*,** 4 pp, (Bul 2146-C) Illinois Testing Laboratories, Inc.
7289 on Reader Service Slip.

**Non-indicating temperature controller has high degree of accuracy*,** 2 pp, (Lit.) Minneapolis-Honeywell Regulator Co.
7296 on Reader Service Slip.

**Greater uniformity with cam-set schedule controllers†,** (Data sheet 208-3) Foxboro
7368 on Reader Service Slip.

**Incorporate conveyor scale system in your process scheme†,** (Bul 60) Weighing Control Components,
7369 on Reader Service Slip.

**Bin level control†,** (Detailed Literature) Bin-Dicator Co.
7370 on Reader Service Slip.

**Proper metering improves quality, saves time†,** (Meter Data Manual 566 JFP) Neptune Meter Co.
7371 on Reader Service Slip.

**Case histories describe specific uses for various switches,** 8 pp, (Uses Unlimited, Vol 11, No. 4) Micro Switch Div. of Minneapolis-Honeywell
7372 on Reader Service Slip.

**Complete line of electrically controlled magnetic solenoid valves,** 20 pp, (Bul 85-D) Magnatrol Valve Co.
7373 on Reader Service Slip.

**Describes portable, small and large bench and dormant platform counting scales,** 5 2-page bulletins, (Buls Y63, Y62, Y61 and Y64) Detecto Scales
7374 on Reader Service Slip.

**Midget 3-way "quick exhaust" solenoid valves,** 2 pp, (Bul 8317) Automatic Switch Co.
7375 on Reader Service Slip.

**Lists pressure & vacuum gauges, indicating pneumatic controllers, and pneumatic transmitters,** 4 pp, (Bul 3015) United States Gauge Division, American Machine and Metals, Inc.
7376 on Reader Service Slip.

**From 10 to 100,000 ampers interrupting capacities molded-case circuit breakers,** 40 pp, (Bul 5001-1A) I-T-E Circuit Breaker Company
7377 on Reader Service Slip.

### Laboratory Instruments, Accessories

**Describes line of disposable culture dishes, tubes and flasks as well as unbreakable plastic lab ware,** 24 pp, (Cat No. P59) Will Corp.
7378 on Reader Service Slip.


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## new literature

### Sanitation

**Burns odor out of air electrostatically*,** 2 pp, (Tech Bul A-60) Morris Deodorizers, Inc.
7216 on Reader Service Slip.

**Cleaning in the bottling plant, from syrup room to filler,** 12 pp, (Booklet) Oakite Products, Inc.
7381 on Reader Service Slip.

**375 industrial chemicals,** 44 pp, (General Catalog), The Dow Chemical Company
7382 on Reader Service Slip.

### Maintenance

**Where to use SS drums; how to care for them*,** 12 pp, (Booklet) Inland Steel Container Co., Division of Inland Steel
7207 on Reader Service Slip.

**Intercepts grease and discharges it at the turn of a valve†,** (Manual W) Josam Mfg. Co.
7383 on Reader Service Slip.

**Dry fluid drive†,** (Technical Bulletin) Dodge Mfg. Corp.
7384 on Reader Service Slip.

**Paints that dry in less than 30 minutes*,** 38 pp, (From No. 259) Rust-Oleum Corp.
7217 on Reader Service Slip.

**Systems for every type of product recovery and dust collection job†,** (Bul 52A) Pulverizing Machinery Div., Metals Disintegrating Co., Inc.
7385 on Reader Service Slip.

**Descale with safety and convenience†,** (Bul B-6564) Oakite
7386 on Reader Service Slip.

**Barrel-to-bearing lubrication†,** (Alemite Cat) Stewart-Warner
7387 on Reader Service Slip.

**Detailed buyers' guide for many types of special steels,** 40 pp, (Cat) The Carpenter Steel Company
7388 on Reader Service Slip.

**Offers broad line of rainwear and protective clothing,** 12 pp, (Bul 1312-2) Mine Safety Appliances Company
7389 on Reader Service Slip.

**Line of oilers and oil-controls described,** 4 pp, (Circular) Lunkenheimer Co.
7390 on Reader Service Slip.

**Determining moisture in raw and refined sugars by Nuclear Magnetic Resonance,** 2 pp, (Material Study Report #27.58) Schlumberger Well Surveying Corp.
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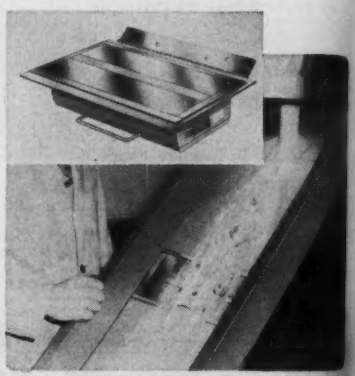

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## *new literature*

### Piping, Pumps, Valves Accessories

**Corrosion resistance of valves to 390 different fluids*,** 8 pp, (Lit) Hydromatic, Inc.
7208 on Reader Service Slip.

**Hose stations and mixing units for hot and cold water, steam and cold water†,** (Cat and specifications) Strahman Valves
7395 on Reader Service Slip.

**Spray nozzle application ideas†,** (Data Sheets) Spraying Systems
7396 on Reader Service Slip.

**Numerous applications for spray nozzles†,** (Cat 1) Monarch Mfg. Works
7397 on Reader Service Slip.

**Valve is seatless, sanitary, quick-opening, interchangeable, leak-proof and light weight†,** (Technical Data File) Stehlin Corp.
7398 on Reader Service Slip.

**Complete line of stainless steel valve†,** (Cat) Jenkins Bros.
7399 on Reader Service Slip.

**Describes and illustrates gate valve with nylon discs,** 2 pp, (Bul NP-76E) OPW-Jordan
7400 on Reader Service Slip.

**Electrically operates wide range of slip steam valves,** 8 pp, (Spec S1016-2) Minneapolis-Honeywell Regulator Company
7401 on Reader Service Slip.

### Miscellaneous

**Equipment leasing plan outlines reasons for leasing and answers common questions on leasing practice and procedure,** 6-page, fold-out brochure, United States Leasing
7402 on Reader Service Slip.

**Describes routine laboratory services in research and testing,** 4-page brochure, Harris Laboratories, Inc.
7403 on Reader Service Slip.

**Complete line of silicones for antifoam and release agents, etc.,** 8 pp, (Bul CDS-129B) General Electric
7404 on Reader Service Slip.

**Provides technical data on thermal custom insulation blankets,** 4 pp, (Bul #6019) Electrofilm Technical Service
7405 on Reader Service Slip.

**Catalog of emergency lighting equipment,** 8 pp, Electric Cord Company
7406 on Reader Service Slip.

**Describes over 400 synthetic organic chemicals,** 28 pp, (Booklet) Union Carbide Chemicals Co.
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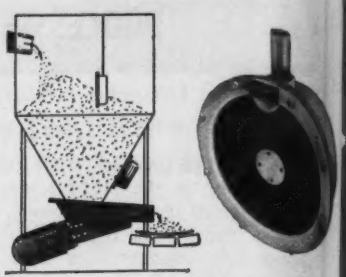

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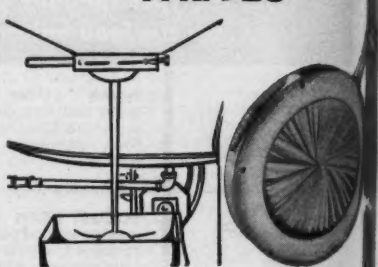

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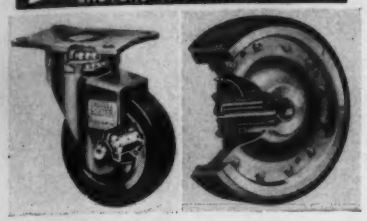

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# ADVERTISERS in this issue


### A

Airslide and Dry-Flo Car Division, General American Transportation Corporation ..... 114
Alemite Division, Stewart-Warner Corporation ..... 14
Alvey Conveyor Manufacturing Company 109
American Food Laboratories, Inc. ..... 63
American Steel & Wire Division, Cyclone Fence Dept., United States Steel 103
Angelus Sanitary Can Machine Company 94
Ashworth Bros., Inc. ..... 135

### B

Bauer Bros. Co., The ..... 142
Bin-Dictator Co., The ..... 81
Bliss Company, E. W. ..... 111
Burns & Sons, Inc., Jabez ..... 46
Butler Manufacturing Company ..... 127

### C

Cambridge Wire Cloth Co., The ..... 112
Centrico Incorporated ..... 134
Chain Belt Company ..... 105
Chemo Puro Subsidiary of Century Chemical Corporation ..... 19
Cherry-Burrell Corporation ..... 136-137
Chisholm-Ryder Co. Inc. ..... 130
Cleveland Vibrator Co., The ..... 104
Clinton Corn Processing Company ..... 73
Clipper Belt Lacer Company ..... 132
Cloroben Chemical Corporation ..... 45
Consolidated Packaging Machinery Corp., A Subsidiary of International Paper Company ..... 97
Container Corporation of America ..... 98
Creamery Package Mfg. Company, The ..... 3rd Cover
Crown Zellerbach Corporation, Gaylord Container Division ..... 89
Cyclone Fence Dept., Amer. Steel & Wire Div. United States Steel ..... 103

### D

Darnell Corporation, Ltd. ..... 151
Day Company, The ..... 108
Diamond Chain Company, Inc., A Subsidiary of American Steel Foundries 116
Diamond Crystal Salt Co. ..... 152
Distillation Products Industries division of Eastman Kodak Company ..... 65
Dodge Manufacturing Corporation 141
Dodge Truck Division, Chrysler Corporation ..... 23
Dodge & Olcott Inc. ..... 4
Dorr-Oliver Incorporated ..... 124
Dow Corning Corporation ..... 120

### E

Eastern Stainless Steel ..... 128
Eastman Chemical Products, Inc. subsidiary of Eastman Kodak Company 72
Edlund ..... 90
Edmont Manufacturing Company ..... 77
Electronic's Inc. ..... 147
Entoleter Inc., a subsidiary of American Manufacturing Co., Inc. ..... 9
Erie Ceramic Arts Company, The, Standards Dept. ..... 143
Eriez Mfg. Co. ..... 148
Exact Weight Scale Co., The ..... 99

### F

Fairbanks, Morse & Co. ..... 119
Flavorex Co. Inc. ..... 20
Florasynth Laboratories, Inc. ..... 25
Food Machinery and Chemical Corporation, Canning Machinery Division 18
Ford Motor Company ..... 34-35
Foxboro Company, The ..... 121
Frick Company ..... 140
Fries & Fries ..... 57
Fritzsche Brothers, Inc. ..... 44
Fuller Company, Subsidiary of General American Transportation Corporation 96

### G

Gardner-Denver Company ..... 139
Gas Atmospheres, Inc. ..... 143
Gaylord Container Division, Crown Zellerbach Corporation ..... 89
General American Transportation Corporation, Airslide and Dry-Flo Car Division ..... 114
General Machinery Corporation ..... 134
General Mills, Oilseeds Division ..... 10
Givaudan Flavors Inc. ..... 49
Griffith Laboratories, Inc., The ..... 61

### H

Hayssen Manufacturing Company ..... 88
Hercules Powder Company, Huron Milling Division, Virginia Cellulose Department ..... 22
Hertz Truck Lease ..... 115
Holz Rubber Company, Inc. ..... 146
Howe Scale Co., The, A Subsidiary of American Manufacturing Company, Inc. ..... 8
Hubinger Company, The ..... 64

### I

Ingersoll-Rand ..... 118
Inland Steel Container Company, Division of Inland Steel Company ..... 97
International Flavors & Fragrances Inc. ..... 4th Cover
International Salt Company ..... 60

### J

Jamison Cold Storage Door Co. ..... 126
Jenkins Bros. ..... 83
Josam Manufacturing Co. ..... 81

### K

Keever Starch Co., The ..... 71
Kelco Co. ..... 74
Kohnstamm & Co., Inc., H. ..... 55
Kraft Foods Industrial Division ..... 15-17
Krenz Incorporated, Oscar ..... 149

### L

Ladish Co., Tri-Clover Division ..... 12
Lake States Yeast and Chemical Division of St. Regis Paper Company ..... 51
Land O'Lakes Creameries, Inc. ..... 6
Langsenkamp Co., F. H. ..... 143
La Porte Mat & Mfg. Co. ..... 11
Link-Belt Company ..... 107

### M

Madsen Works, Baldwin-Lima-Hamilton, Construction Equipment Division .... 146
Manton Gaulin Manufacturing Co., Inc. 133
Master Mechanics Co., The ..... 85
Meer Corporation ..... 149
Mercoid Corporation, The ..... 147
Metals Disintegrating Company, Inc., Pulverizing Machinery Division ..... 13
Minnesota Mining and Manufacturing Company ..... 93


(*Continued on next page*)

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(Continued from preceding page)

Monarch Mfg. Works, Inc. ..... 125
Morehouse-Cowles, Inc. ..... 132
Morningstar-Paisley, Inc. ..... 58
Morton Salt Company, Industrial Division ..... 50
Multi-Metal Wire Cloth Co., Inc. ..... 145

N

National Starch and Chemical Corporation ..... 62
National Truck Leasing System ..... 113
Neptune Meter Company ..... 117
Nestle Company, Inc., The ..... 41
Niagara Blower Company ..... 92
Nukem Products Corp., A Subsidiary of Amercoat Corp. ..... 84

O

Oakite Products, Inc. ..... 80
Olin Mathieson Chemical Corp., Packaging Division ..... 95
Orr & Sembower, Inc. ..... 79

P

Pacific Vegetable Oil Corp. ..... 43
Paperlynen Company ..... 149
Penick & Ford, Ltd., Incorporated ..... 24
Pfaudler Company, The, A Division of Pfaudler Permutit, Inc. ..... 122
Pfizer & Co., Inc., Chas., Chemical Sales Div. ..... 52-53
Powell Company, The Wm. ..... 78
Precision Valve Corporation ..... 91
Protective Lining Corporation ..... 106
Pulverizing Machinery Division, Metals Disintegrating Company, Inc. ..... 13
Pure Carbonic Company, A Division of Air Reduction Company, Incorporated 21
Putman Publishing Company .... 43, 92, 147

R

Red Star Yeast & Products Company .... 54
Refined Syrups & Sugars, Inc. ..... 69
Ritter & Co., F. ..... 3

S

Sandvik Steel, Inc. ..... 151
Sarco Company, Inc. ..... 124
Screw Conveyor Corporation ..... 123
Sheffield Chemical, A Division of National Dairy Products Corporation .... 20
Shulton Fine Chemicals, Division of Shulton, Inc. ..... 26
Simpson Company, The Orville ..... 129
Smith Corporation, A. O., Harvestore Products ..... 7
Spraying Systems Co. ..... 97
Sprout-Waldron ..... 120
Staley Mfg. Co., A. E. ..... 19, 76
Standard Conveyor Co. ..... 123
Steelcote Mfg. Co. ..... 104
Stehlin Corporation ..... 130
Stewart-Warner Corporation, Alemite Division ..... 14
Strahman Valves, Inc. ..... 81
Strong Scott Mfg. Co., The ..... 131, 144
Sturtevant Mill Co. ..... 140
Sunkist Growers, Products Sales Dept. 39
Syntron Company ..... 150

T

Takamine, Miles Chemical Company, Division of Miles Laboratories, Inc. .. 73
Taylor Instrument Companies ..... 123
Todd Shipyards Corporation, Products Division ..... 85

U

United States Steel, Amer. Steel & Wire Div. Cyclone Fence Dept. ..... 103
Universal Oil Products Company ..... 57

V

Viber Company ..... 140
Vico Products Company ..... 60
Vilter Manufacturing Company, The .... 142

W

Walker Stainless Equipment Co. ..... 133
Waukesha Foundry Company ..... 139
Wear-Ever Aluminum, Inc. ..... 138
Weighing & Control Components, Inc., Div. of CompuDyne Corp. ..... 88
West Chemical Products, Inc. ..... 85, 146
Western Condensing Company .. 2nd Cover
Weston Instruments Division, Daystrom, Incorporated ..... 125
Whitten Co., Inc., J. O. ..... 72
Wiley & Sons, Inc., John ..... 140
Wisconsin Alumni Research Foundation 11

Y

Yarnall-Waring Company ..... 82

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| 7130 | 7178 | 7226 | 7274 | 7322 | 7370 |
| 7131 | 7179 | 7227 | 7275 | 7323 | 7371 |
| 7132 | 7180 | 7228 | 7276 | 7324* | 7372 |
| 7133 | 7181 | 7229 | 7277 | 7325 | 7373 |
| 7134 | 7182 | 7230 | 7278 | 7326 | 7374 |
| 7135 | 7183 | 7231 | 7279 | 7327 | 7375 |
| 7136 | 7184 | 7232 | 7280 | 7328 | 7376 |
| 7137 | 7185 | 7233 | 7281 | 7329 | 7377 |
| 7138 | 7186 | 7234 | 7282 | 7330 | 7378 |
| 7139 | 7187 | 7235 | 7283 | 7331 | 7379 |
| 7140 | 7188 | 7236 | 7284 | 7332 | 7380 |
| 7141 | 7189* | 7237 | 7285 | 7333 | 7381 |
| 7142 | 7190 | 7238 | 7286 | 7334 | 7382 |
| 7143 | 7191 | 7239 | 7287 | 7335 | 7383 |
| 7144 | 7192 | 7240 | 7288 | 7336 | 7384 |
| 7145 | 7193 | 7241 | 7289 | 7337 | 7385 |
| 7146 | 7194 | 7242 | 7290 | 7338 | 7386 |
| 7147 | 7195 | 7243 | 7291 | 7339 | 7387 |
| 7148 | 7196 | 7244 | 7292 | 7340 | 7388 |
| 7149 | 7197 | 7245 | 7293 | 7341 | 7389 |
| 7150 | 7198 | 7246 | 7294 | 7342* | 7390 |
| 7151 | 7199 | 7247 | 7295 | 7343 | 7391 |
| 7152 | 7200 | 7248 | 7296 | 7344 | 7392 |
| 7153 | 7201 | 7249* | 7297 | 7345 | 7394 |
| 7154* | 7202 | 7250 | 7298 | 7346 | 7395 |
| 7155 | 7203 | 7251 | 7299 | 7347 | 7396 |
| 7156 | 7204 | 7252 | 7300 | 7348 | 7397 |
| 7157 | 7205 | 7253 | 7301 | 7349 | 7398 |
| 7158 | 7206 | 7254 | 7302 | 7350 | 7399 |
| 7159 | 7207 | 7255 | 7303 | 7351 | 7400 |
| 7160 | 7208 | 7256 | 7304 | 7352 | 7401 |
| 7161 | 7209 | 7257 | 7305* | 7353 | 7402 |
| 7162 | 7210 | 7258 | 7306 | 7354 | 7403 |
| 7163 | 7211 | 7259 | 7307 | 7355 | 7404 |
| 7164 | 7212 | 7260 | 7308 | 7356 | 7405 |
| 7165* | 7213 | 7261 | 7309 | 7357 | 7406 |
| 7166 | 7214 | 7262 | 7310 | 7358 | 7407 |
| 7167 | 7215 | 7263 | 7311 | 7359 | 7408 |
| 7168 | 7216 | 7264 | 7312 | 7360 | 7409 |
| 7169 | 7217 | 7265 | 7313 | 7361 | 7410* |
| 7170 | 7218 | 7266 | 7314 | 7362 | 7411 |
| 7171 | 7219 | 7267 | 7315* | 7363 | 7412 |
| 7172 | 7220 | 7268 | 7316 | 7364 | 7413 |
| 7173 | 7221 | 7269 | 7317 | 7365 | 7414 |
| 7174 | 7222 | 7270 | 7318* | 7366 | 7416 |
| 7175 | 7223 | 7271 | 7319 | 7367 | Back |
| 7176 | 7224 | 7272 | 7320 | 7368 | Cover |
| 7177 | 7225 | 7273 | 7321 | 7369 | 7415 |

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## that's interesting

### Why 'cantaloupe'?

The name "cantaloupe," used for the small, oval, heavily-netted muskmelon, is derived from the name of a 16th century papal estate in Ancona, outside of Rome — Cantalup or Canteluppi. It was there that the rock melon was first grown in Europe from seeds from Armenia.

### Lime juice in the lime-light

The use of lime juice by sailors and explorers to ward off scurvy dates back to the early 18th century. In 1795, it officially became a part of the daily diet of the British navy.

The daily use of the juice brought about the nickname of "Limey" for British sailors and the term "Limejuicers" for their ships.

### Some very dry statistics

For the sociable souls, here's one way to visualize a millionth part of something, as in current discussions on food additives. One drop of vermouth in 16 gallons, or 80 fifths, of gin gives a ratio of a million to one. It also gives a very *very* dry martini.

Another way to put it: if the perfect host had used a

fifth of gin a day for the last 1960 years to serve such martinis, he would still have more than a quarter of his first fifth of vermouth still unused.


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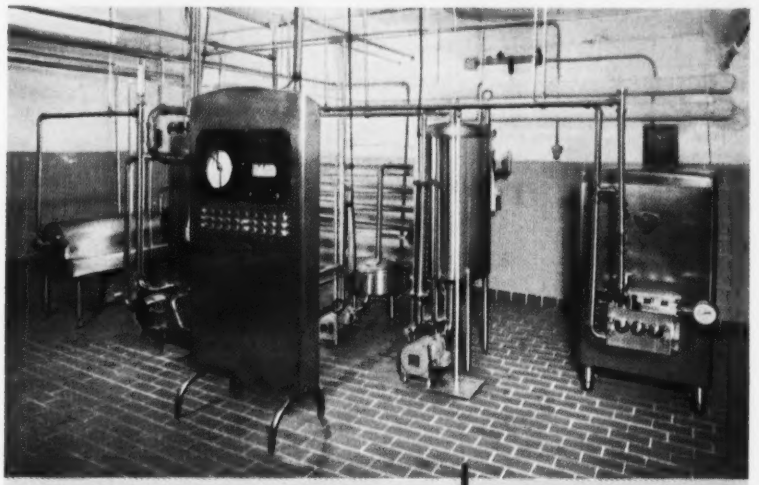

▲ *CP UHT Pasteurizing System. Left to right: Swept Surface® heater, Rotary Pump, Crescent® Plate Heat Exchanger, Control Panel, Centrifugal Pumps, Vacuum Cylinder and Homogenizer.*

*CP 3M-30 Continuous Freezer, Fruit Feeder (not shown) and Multi-Compartment Flavor Tank.* ▼

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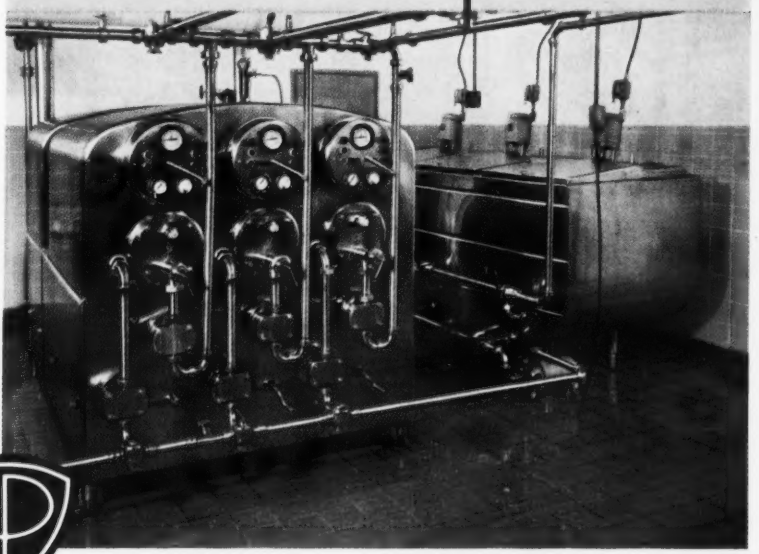

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